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THE JOURNAL

OF THE

American Medical Association

Subscription, $7.00 | PUBLISHED WEEKLY | Single Copies, 25 Cents

VOLUME 107, No. 8

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535 North Dearborn Street, Chicago, Ill.

AUGUST 22, 1936

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A.M.A. SESSION • ATLANTIC CITY, N. J. • JUNE 7-11, 1937

Today's Clinical Endocrinology

Dr. William Wolf's *brand new book*—"Endocrinology in Modern Practice"—met with immediate success. Although published scarcely one month ago, the demand for it from all over the country indicates decisively that the medical profession wanted, *and was anxiously waiting for,* this book. It is a book on *Clinical* Endocrinology—a book that summarizes the data, the experience of research and laboratory workers and clinicians, and *applies their findings* to the everyday practice of the Family Physician as well as to that of the Surgeon and Specialist.

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Fuller details in SAUNDERS ADVERTISEMENT—Page 3

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THE JOURNAL of the American Medical Association is published weekly by the American Medical Association. 535 North Dearborn Street, Chicago, Ill. Subscription price, $7.00 a year. 25c a copy. Canadian $8.50 Foreign $11.00 Entered as second class matter June 25, 1885, at the Postoffice at Chicago, Ill., under Act of March 3, 1879

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The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. 107, No. 8 — COPYRIGHT, 1936, BY AMERICAN MEDICAL ASSOCIATION — CHICAGO, ILLINOIS — AUGUST 22, 1936

RECENT ADVANCES IN GASTRO-ENTEROLOGY

CHAIRMAN'S ADDRESS

ERNEST H. GAITHER, M.D.

BALTIMORE

A wide diversity of opinion exists among the members of the American Medical Association as to what disease or group of diseases may constitute a specialty; this nonagreement is particularly marked in the case of diseases of the abdominal organs.

In any field it is essential that there should be a number of men thoroughly trained in every detail and keen not only to keep abreast of all advances in research but also to make original contributions in clinical and laboratory studies. A body of such specialists whose advice is avaliable to practitioners lacking opportunity for comprehensive study in that line of work is not only invaluable but indispensable.

It is my intention to set forth in this paper my own considered opinion as to what gastro-enterology as a distinct specialty involves, together with my ideals as to preparation for the handling of this branch of our profession, and progress during the past decade. In the future as in the past, I shall actively oppose narrow specialism in any branch of medicine; there can be no doubt that such an unfortunate state has arisen and continues to exist, to the inevitable detriment not only of specialism but also of medicine as a whole.

The term "stomach specialist" is of course anathema; I myself dislike "gastro-enterologist" as well; it is at once too narrow and too vague. I prefer to be considered a properly trained internist who is devoting himself especially to diseases of the abdomen having both direct and indirect relationship with the digestive organs. By what properly descriptive term this specialty shall be called is as yet a moot point.

There are manifested in various parts of the abdomen, on many occasions, troublesome symptoms that are not caused by intra-abdominal disease but by extrinsic lesions in tissues, a single organ or a group of organs; in such cases a man untrained in the special study necessary to a diagnostician of diseases of the digestive tract and the abdomen as a whole will find himself wofully inadequate, and an improper diagnosis may easily result in dire consequences to the unfortunate patient.

I feel very strongly in regard to this, considering it essential that a man be required to give proof of adequate and comprehensive training in internal medicine, and of thorough study in the domain of abdominal disease, before he may declare himself a specialist in this vital subject; he should by all means be submitted to tests by those best fitted to pass on his qualifications before he dare assume a title so hardly earned and so highly esteemed by men who have devoted themselves to research in this field.

Read before the Section on Gastro-Enterology and Proctology at the Eighty-Seventh Annual Session of the American Medical Association, Kansas City, Mo., May 14, 1936.

RECENT WORK

One of the most stimulating recent publications is the monograph by Faber, in which he clearly sets forth his own views and those of other eminent authorities as to proofs of the presence and frequency of both acute and chronic gastritis. His report on the method of preparing the tissues in order to prevent postmortem changes; his statements as to the effect of acute infectious diseases on the gastric membranes; the relation of acute and chronic gastritis to superficial and deep erosions (the latter finally leading to chronic ulcer); the relation of acute gastritis to hyperacidity, the chronic stage to anacidity and later pernicious anemia; the fact that chronic gastritis may and often does precede ulcer and carcinoma—all his points are most interesting and worthy of consideration, no matter what our opinions may be with regard to these vital problems.

He makes the arresting statement that in his researches he found a large percentage of anacidity among the relatives of patients suffering with pernicious anemia. He believes that one always finds very pronounced signs of chronic inflammation in patients with chronic anacidity; also that in pernicious anemia there is an advanced gastritis with or without severe atrophy of the mucous membrane; further, that pernicious anemia can exist without anacidity; finally, that it is possible to see acid secretion start again in certain cases under treatment. He quotes Hurst as stating that in no less than four cases he has seen the acid secretion come back in pernicious anemia while the stomach was under lavage treatment, and the anemia thereafter disappeared. He develops many other interesting theories on this subject.

It now seems opportune to call attention to the studies of Bloomfield and Polland on the secretory function of the stomach; these studies are convincingly presented in the monograph "Gastric Anacidity." These authors have made innumerable researches, and I feel it important to quote the summary of Bloomfield's study on clinical aspects of gastric secretion:

> Because of the wide variations in gastric secretion which are found in healthy people, it is difficult to draw conclusions of diagnostic value in patients. In practice, measurement of gastric secretion is helpful in the diagnosis of pernicious anemia and perhaps certain types of hypochromic anemia—of gastric and duodenal ulcer, and of cancer of the stomach. The "routine" employment of test meals, even in the case of patients with indigestion, is useless; whereas an occasional well conducted measurement of gastric secretion performed to aid in solving a special diagnostic perplexity is sometimes of the greatest value.

Undoubtedly one of the most brilliant contributions of recent years is Castle's demonstration that pernicious anemia is usually due to the absence of an essential gastric secretory substance commonly associated with achlorhydria.

Hollander has lately conducted a splendid piece of research regarding the composition of pure gastric juice; in this connection should be mentioned the thorough and excellent studies by Martin. Granturco, Quigley, Lehrman and Nelson have also made outstanding additions to the literature on the physiology of digestion.

Greengard, Maison and Ivy have isolated a substance from the intestinal mucosa which is free from objectively detectible toxic factors; it inhibits gastric secretion and motility in the dog and is known as enterogastrone. The authors state that it may prove to be of practical value because it possesses the gastric inhibitory attributes of atropine without its undesirable secondary effects and may thus be advantageous in certain cases of peptic ulcer.

Dragstedt and his associates have contributed a valuable article, "The Pathogenesis of Acute Dilatation of the Stomach"; this should appeal both to internist and to surgeon.

Rehfuss has done notable work in popularizing and simplifying the fractional study of gastric secretion; he has carried on many other studies, which culminated in the recent publication of his textbook, entitled "Medical Treatment of Gall Bladder Disease." I must emphasize in this connection the work of Lyon on gallbladder drainage; it is based on the work of Meltzer, an eminent leader in physiology of the digestive tract, and Lyon has lately incorporated his own researches in a monumental treatise, "Atlas on Biliary Drainage Microscopy."

The development of the flexible gastroscope accounts for much progress and is destined to play an increasingly important rôle in diagnosis of diseases of the stomach; Schindler has been a leader in this field and is now making further exhaustive studies. Many investigators are following in his footsteps, and it is to be predicted that within the next few years our knowledge of gastric pathology will be vastly expanded.

As to syphilis of the stomach, the original works of Clasen and of Eusterman, published not long ago, present the subject in the ablest possible manner and are to be heartily recommended, as are also the excellent papers by O'Leary, Moore and Aurelius; Biscoe issued last year a thorough study of this lesion of the stomach, and Pusch gave an interesting review of thirty-five selected cases. While the contributions to the literature in this field have not been extensive, they are too numerous to be included in full in this limited paper.

Pain is an old, old subject, yet ever new; and while much of real value has been written, I may refer especially to Christensen's fine monograph "Pathophysiology of Hunger Pains" and to the recent publications of Boyden, Rigler and Rivers dealing with localization, genesis and probable pathways of pain; certain it is that much remains to be learned concerning the details of pain mechanism in visceral disease.

The relation of allergy to gastro-intestinal changes and symptoms continues to make splendid progress under Rowe, Duke, Vaughan and other investigators, and all this work promises to be most helpful in diagnosis and therapy.

The question of the etiology of peptic ulcer still baffles and intrigues us all. Nothing of a definite, conclusive nature is as yet forthcoming; and no less eminent an investigator than Ivy has discontinued studies on the subject. In a late issue of the *American Journal of Digestive Diseases and Nutrition*, Smithies gives a comprehensive review of the various current theories concerning the etiology of peptic ulcer.

With regard to the treatment of peptic ulcer, the early work of Sippy and Smithies must be considered; while their views and methods differed greatly, both were true pioneers, and on a basis of their efforts much useful knowledge has been gained. Smithies has been a prolific contributor to the advancement of gastroenterology in all its aspects, and his latest achievement has been the publication of the review to which I have referred.

The capacious cup of literature is brimming with productions having to do with the parenteral treatment of peptic ulcer. The various remedies proposed are legion; the most popular at this time are those containing histidine and nonspecific protein. Many workers are extremely enthusiastic over the results obtained, but I feel that we should postpone final evaluation until a far greater number of cases have been treated, over a longer period.

Sara Jordan and her associates have produced what seems to me incontrovertible evidence for the efficacy of conservative or orthodox therapy for the healing of a large majority of peptic ulcers; the contribution is a splendid piece of clinical research. However, a continuation of comparative studies by both methods should be encouraged.

The inaccessibility of the small intestine has greatly handicapped morphologic, secretory, chemical and bacteriologic study of this part of the digestive tract; hence comparatively little work has been available to students in this field; however, certain methods of investigation have recently been adopted, and these will undoubtedly lead to more rapid progress in research.

Certainly the excellent studies and methods being perfected by Grier Miller and his associates relative to the intubation of the small intestine will be of the greatest aid in the study of secretion, absorption, motility, bacteriology and chemistry of this portion of the digestive tract. Gray has lately presented the results of an elaborate research, "The Influence of Some Organic and Inorganic Acids on the Motility of the Small Intestine." A very fine study, "A Symposium Concerned with the Duodenal Factors in the Neutralization of Acid Chyme," has been made by Mann, Imes, Stevens, McRoberts and Hoerner; this forms an admirable addition to the data on physiology of the small intestine, and the relation of pancreatic secretion. A valuable clinical study by Bargen and Guthrie is "The Effects of Drugs on the Motility of Isolated Segments of the Intestine of Man." In the category of works on the small intestine should be mentioned the article by Alvarez and Hosoi, "Conduction in Different Parts of the Small Intestine." Mackie and Pound, and Ravdin and his associates, must also be congratulated on their important studies in this subject.

Crohn presents a splendid piece of work, "Regional Ileitis," claiming the discovery of a new disease entity. As in all such cases, speculation is rife as to whether this is really a new disease or the ultimate outcome of a specific or nonspecific infection with changes of an ulcerative nature. Bockus has also written an exceptionally fine paper on this subject. An extended period of experimentation in a larger number of cases will be needed before a final decision can be reached.

Thoughtful consideration must be given to Felsen's assertion, based on exhaustive clinical research, that chronic idiopathic ulcerative colitis, and regional ileitis, represent the end result of bacillary dysentery.

Bargen has done a colossal piece of clinical and laboratory work on ulcerative colitis; he asserts that this disease is due to a specific organism and reports remarkable success following treatment by vaccines and serum, in conjunction with proper hygiene and diet, and a certain amount of drug therapy.

In direct opposition to the claims of Bargen are the views expressed in the equally excellent studies of Paulson, who believes that ulcerative colitis is not due to the specific organism described by Bargen but is caused by a variety of organisms, as well as other factors. Now appears Sullivan with a paper which merits consideration because it attacks a question which is in the minds of many at this time, namely, the effect of psychogenic factors in the production of somatic diseases; the title of this provocative work is "Psychogenic Factors in Ulcerative Colitis."

Hurst of London, an honorary member of the American Gastro-Enterological Association, is a prolific contributor of extremely valuable work referable to the digestive tract, and his "Constipation and Allied Intestinal Diseases," written some years ago, remains an outstanding classic.

Study of the colon has been intensively followed, and so many have been the splendid publications that a complete list would require all my allotted space.

The various phases of liver activity continue to provide an alluring array of problems, to the solution of which many eminent scholars are devoting time and study; the number of publications showing encouraging results is so great as to preclude specific mention. I must note, however, Ivy's achievement in isolating a new hormone, cholecystokinin, which exhibits a specific action on the gallbladder; such a substance should offer great therapeutic possibilities and may ultimately prove helpful in diagnosis.

I shall touch briefly on the progress of liver function tests. On the liver devolves so wide a range of duties that as yet no single really dependable procedure, diagnostic of function as a whole, has been perfected. Yet, thanks to our indefatigable explorers, we have available methods which are useful under varying conditions and in certain diseases; and the application of two or more of these will in many instances furnish us with well grounded diagnostic information. The tests now in greatest favor are the van den Bergh, coagulation time, sedimentation, galactose tolerance, bromsulfalein, rose bengal and Takata-Ara.

Snell and Plunkett made a detailed clinical research in order to determine the diagnostic value of the hippuric acid test; they concluded that the rate of synthesis of hippuric acid is a reasonably accurate and satisfactory test for the determination of parenchymatous hepatic damage, particularly in the "surgical types" of jaundice. Excellent progress is being made in this domain, and the caliber of the men exploring this subject is an assurance of ultimate success.

In regard to studies of the pancreas, stimulating achievements can be reported. The names of Ivy, Mann, McClure, Gamble, McIver, McCaughan, Martin, Silverman, Elman, Le Sage, Dragstedt and Babkin loom large as untiring investigators; that many other valuable workers must be omitted from the list is due to limited space, not to a lack of appreciation of their notable contributions.

Various accepted reliable methods of estimating enzymatic activity were comprehensively presented in the June 1934 issue of the *American Journal of Digestive Diseases and Nutrition* by the Enzyme Committee of the American Gastro-Enterological Association; this committee is of the opinion that further comparative studies of methods, especially for the determination of activity of the proteolytic enzymes, seem indicated; and the number of normal individuals tested should be increased until statistically accurate curves can be drawn.

Briefly, the committee concludes that enormous variations in enzymic activity occur normally, that the presence of amylase in duodenal juices does not prove its pancreatic origin, and that the activity of the specific enzyme should be recorded in percentage of substrate converted to simple building stones; namely, sugar, amino acids and fatty acids. In the case of amylase the question of substrate (soluble starch) is relatively simple, but for protease and lipase the question of substrate deserves some study; the measure of lipolytic activity of the duodenal juices constitutes the most satisfactory test for pancreatic enzyme so far available; no standardized methods exist even among the authorities in the field, and it is evident that under existing conditions comparative value cannot be obtained. Therefore, if standardization is to be accomplished, study must be undertaken with each enzyme in turn. At present, the only diagnostic significance of enzyme concentration in the duodenal contents is the persistent absence of enzyme indicating obstruction of the pancreatic ducts, such as a malignant growth in the head of the pancreas; this can be revealed by any of the tests, especially that for lipase.

They recommend that outstanding authorities, each with selected co-workers, be appointed to study and prepare simple and more accurate lipase and trypsin tests, these to receive comprehensive application by a large number of observers, in order that a reliable standardization may be achieved.

I should call attention to the work of T. R. Brown on the relationship of migraine to a diet rich in carbohydrate, and the brilliant result often observed when a diet with minimal amounts of starchy food is applied. There is also his excellent presentation of the intimate relationship of hepatobiliary disease to cardiac function and symptoms, showing that many patients had been diagnosed and treated as cardiac cripples and veritable invalids, though later on removal of an infected gallbladder restored cardiac function, eliminated symptoms, and enabled these former chronic sufferers to recover normal health.

Dr. Madge T. Macklin presented in 1934 a timely essay relative to heredity in disease; she is of the opinion that a knowledge of inheritance in disease is of utmost importance to any practitioner of medicine or surgery and that to no group is it more essential than those who make a special study of gastro-enterology. This article is most illuminating, and its subject is worthy of continued study by our members. Hurst has definitely committed himself to the idea that the constitutional factor diathesis plays an important rôle in predisposing an individual to certain diseases of the digestive tract.

It would be a congenial task to dwell at length on the efforts being put forth on behalf of the problems of nutrition and metabolism, of endocrine dysfunction related to the digestive tract, and the splendid progress made along a wide front in the study of sprue and

parasitic disease; indeed, there is no phase of our subject that I would not enjoy traversing in detail; and nothing would gratify me more than a complete roster of our able clinical and laboratory researchers and writers. The fact that my references must cover many years in a few minutes limits not only this survey but my encomiums, and all will sympathize with me in this dilemma.

It is possible to refer only briefly to the achievements of the past few years in roentgenologic study of the abdomen; but I wish to pay tribute to those who have made such inspiring progress in x-ray study of the digestive organs. Among the signal accomplishments are Kantor's "Colon Studies," particularly those studies relating to anatomic abnormalities; they have greatly added to our knowledge of this portion of the tract.

Mucosal relief was first brought to the attention of roentgenologists by Forsell in 1913, but it was not until about a decade ago that technic for its study began to be developed; it was then that Berg started his valuable work on the stomach and duodenum, making use of the compression method. Since that time Albrecht, Chaoul and Schatzki have published excellent papers; Schatzki, working at the Massachusetts General Hospital, has developed an equipment which is of great advantage in the diagnosis of early and small ulcerative lesions as well as the gastritides.

Improvement in the technic of introduction of a combination of barium sulfate and air has been particularly advantageous in studies of the colon and in the diagnosis of polypi.

"Polisography" is a method whereby triple exposures of the stomach are made on the same film; it is thus shown that peristaltic movements are absent in areas of inflammation and neoplastic involvement; this should prove helpful in diagnosis.

Kymography, which has been useful in cardiovascular examinations, is now being applied to the study of gastro-intestinal peristalsis, where it should be equally advantageous. Kirklin's studies of idiopathic pyloric hypertrophy and duodenitis merit consideration and praise.

New thorium-containing colloidal compounds have been introduced, but it is doubtful whether they possess any particular advantage over barium sulfate as a contrast meal.

Cholecystography has been of inestimable worth; at present, oral application of the dye is in greatest favor. Stewart recently introduced a most efficient method of intensified administration of the dye which greatly facilitates the visualization of the gallbladder and is especially effective as regards the density of the shadow.

Roentgenologic contributions to the study of the small intestine have been few as compared with the offerings concerned with other portions of the digestive tract; however, the pioneer work of Walter Mills receives our unfailing homage. Of late, Cole, Mackie, Kantor, Soper and others have furnished us with progressive work of exceptional merit.

Roentgenologists have recently given much attention to anomalies of the esophagus with special reference to the congenital short esophagus; splendid work has been forthcoming from Findlay, Kelly, Clerf and Manges.

COMMENT

Incomplete as this presentation has necessarily been, it must have made clear that the men working in the domain of diseases of the digestive tract are not confining their efforts to a restricted field but are continually reaching out to explore all the areas that may conceivably influence that realm. They are constantly evolving new and useful ideas as to etiology, pathology, symptomatology, diagnosis and therapy, in every ramification of the digestive system; every factor bearing on the digestive tract has been considered, every phase of its manifold functions has been studied; and this great volume of effort furnishes us with not only many stimulating problems but also with clues for their final solution. All signs, indeed, point to ever higher pinnacles of achievement.

The recent advances in gastro-enterology have been of such magnitude and distinction that they engender in us a just pride and renew our determination to press forward toward our goal of perfection.

The fellow human beings who place their health, and thus their lives, in our hands, have the right to expect from us all the security that our high standards can provide. These standards can be maintained only if men who wish to enter the field of abdominal diagnosis are first required to submit their capabilities and accomplishments to the unbiased judgment of a thoroughly competent group of workers in this field, zealous for the welfare of mankind and the ideals of their profession.

12 East Eager Street.

THE SIGNIFICANCE OF NEUTRALIZING SUBSTANCES IN RESISTANCE AND RECOVERY FROM POLIOMYELITIS

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During the year just past, the attention of both the lay and the medical public has been focused on field vaccination studies aiming to prevent infantile paralysis. Even though these applications followed specific laboratory trial of recognized immunologic procedures, they were forced to an abrupt halt by the suspicion that a few cases were causally connected with the immunizing procedure.[1] At present it is believed that, as a result of these experiences, a safer method of prevention should be evolved for clinical trial. At this point it is apropos to review the fundamental tenets on which these trials were based. While there have been reports of successful vaccination against other virus diseases, there have been disappointments in both application and interpretation of experiments in this field. For example, while no one denies the advisability of active immunization during the incubation period of rabies, recent experimental studies[2] have denied that such procedures lead to immunity against an infectious dose placed directly in contact with nervous tissue. As will be shown later, a similar question is involved in the interpretation of immunity to poliomyelitis.

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Supported by a grant from the President's Birthday Ball Fund for Infantile Paralysis Research.

Read before the Section on Pediatrics at the Eighty-Seventh Annual Session of the American Medical Association, Kansas City, Mo., May 15, 1936.

1. Leake, J. P.: Poliomyelitis Following Vaccination Against the Disease, J. A. M. A. **105**: 2152 (Dec. 28) 1935.

2. Galloway, I. A.: The "Fixed" Virus of Rabies: The Antigenic Value of the Virus Inactivated by the Photodynamic Action of Methylene Blue and Proflavine, Brit. J. Exper. Path. **15**: 97 (April) 1934.

The question might be raised whether man always acquires an effective immunity against poliomyelitis. In the United States and Canada during the past twenty years, seventeen cases have been reported of a second attack occurring years after a first, including two cases that we have seen.[3] This is an attack rate of 11 per hundred thousand calculated from the 150,000 reported cases.[4] While these data are not statistically significant, this is many times the average rate for these years. The rarity of the disease during the first year of life and the low incidence among adults point to a relative immunity enjoyed by these groups. The fact that a large percentage of individual serums of these groups neutralize the virus of poliomyelitis is now well established and is the obvious explanation of these low attack rates. Are the neutralizing substances an accurate expression of immunity in this disease? Can resistance be present in their absence? Can the nervous system be invaded by the virus in the presence of neutralizing antibodies (humoral immunity)? Are there other factors of defense against the virus (mechanical factors and tissue immunity)? The replies to these and similar questions would furnish a complete answer to the moot point of the efficacy of vaccination as it has been practiced, were the entire data known. In the following discussion we shall attempt an answer in the light of recent experimentation.

PATHOGENESIS OF POLIOMYELITIS: THE ORIGIN OF INFECTION

The contributions of Fairbrother and Hurst,[5] Jungeblut and others[6] have established beyond peradventure that the virus of infantile paralysis travels largely, if not exclusively, in the body by neural pathways (reviewed by Faber[7]). Interruption of a neuron parasitized by the virus, either peripherally or within the central nervous system, blocks passage to the cells of the spinal cord and intervertebral ganglions, the essential site of the disease. The striking resistance to intranasal infection after intracranial section of the olfactory tracts[8] is a demonstration of this thesis. It is considered that the nasal and pharyngeal areas are the usual if not the only site of entry of the virus. Under the experimental state of increased intestinal pressure and of direct contact with the myenteric nerves infection may occur, but these are conditions that never obtain in natural infection (reviewed by Flexner[9]).

Indeed, it is probable that many persons harbor the virus in the nasopharynx, it being in a more or less stable equilibrium with the host.[10] Such conditions postulate that traumatic influences or lowered resistance may allow the virus to ascend into the central nervous system. Tonsillectomy[11] and extreme muscular exertion[12] have been reported as precipitating an attack of poliomyelitis with the characteristic incubation period. The puzzling epidemiologic fact, observed many times a year in the seasonal endemic poliomyelitis of this country, of cases occurring in isolated areas where personal contact can be excluded except through healthy intermediaries, may be explained by parasitization of the nervous system by virus carried in equilibrium with the nasopharynx. This hypothesis has already been confirmed by the isolation of the virus from the nasopharynx[13] with subsequent development of infection (reviewed by Paul, Trask and Webster[14]). Kramer[15] has reported the isolation of the virus from pooled specimens removed by tonsillectomy in a general hospital. Ponderous technical difficulties do not allow the easy multiplication of such observations. The finding of large numbers of adults in the general population who carry neutralizing substances in their blood against the virus of poliomyelitis[16] is indirect evidence of the widespread dissemination of the virus.

Washings of the nasopharyngeal area from certain persons contain virus inactivating property.[17] Whether this is correlated with antiviral properties in the blood is not definitely known but is probable. From the practical point of view there promises to be a method available to increase the normal resistance of the nasopharynx in preventing passage of the virus over the first and thirteenth cranial nerves. Treatment of this area by alum, by tannic acid, by trinitrophenol and by mercurochrome has been signally effective in the hands

3. Quigley, T. B.: Second Attack of Poliomyelitis, J. A. M. A. **102:** 752 (March 10) 1934. Cohen, L.: Anterior Poliomyelitis with Reference to the Occurrence of Two Attacks in the Same Individual, New England J. Med. **213:** 601 (Sept. 26) 1935. Harmon, P. H.: Second Attack of Poliomyelitis, to be published.

4. U. S. Public Health Reports; Personal reports from state and provincial health departments.

5. Fairbrother, R. W., and Hurst, E. W.: The Pathogenesis of and the Propagation of the Virus in Experimental Poliomyelitis, J. Path. & Bact. **33:** 17 (Jan.) 1930. Hurst, E. W., and Fairbrother, R. W.: A Further Contribution to the Pathogenesis of Experimental Poliomyelitis: Inoculation into the Sciatic Nerve, ibid. **33:** 1133 (Oct.) 1930; Further Observations on the Pathogenesis of Poliomyelitis: Intrathecal Inoculation of the Virus, ibid. **35:** 41 (Jan.) 1932.

6. Jungeblut, C. W., and Spring, W. I.: A Note on the Propagation of the Virus in Experimental Poliomyelitis, Proc. Soc. Exper. Biol. & Med. **27:** 1076 (June) 1930.

7. Faber, H. K.: Acute Poliomyelitis as a Primary Disease of the Central Nervous System, Medicine **12:** 83 (May) 1933.

8. Schultz, E. W., and Gebhardt, L. P.: Olfactory Tract and Poliomyelitis, Proc. Soc. Exper. Biol. & Med. **31:** 728 (March) 1934. Lennette, E. H., and Hudson, N. P.: Relation of Olfactory Tracts to Intravenous Route of Infection in Experimental Poliomyelitis, ibid. **32:** 1444 (June) 1935.

9. Flexner, Simon: Respiratory versus Gastro-Intestinal Infection in Poliomyelitis, J. Exper. Med. **63:** 209 (Feb.) 1936.

10. Analogy to louping ill is brought out by F. M. Burnet (Inapparent [Subclinical] Infection of the Rat with Louping Ill Virus, J. Path. & Bact. **42:** 213 (Jan.) 1936.

11. Aycock, W. L., and Luther, E. H.: The Occurrence of Poliomyelitis Following Tonsillectomy, New England J. Med. **200:** 164 (Jan. 24) 1929.

12. Limper, M. A.; Thelander, H. E., and Shaw, E. B.: Poliomyelitis in Adults: Report of Sixty Cases, J. Prev. Med. **5:** 475 (Nov.) 1931.

13. Flexner, Simon; Clark, P. F., and Fraser, F. R.: Epidemic Poliomyelitis: Fourteenth Note: Passive Human Carriage of the Virus of Poliomyelitis, J. A. M. A. **60:** 201 (Jan. 18) 1913; Kling, C., and Pettersson, A.: Keimträger bei Poliomyelitis, Deutsche med. Wchnschr. **40:** 320, 1914.

14. Paul, J. R.; Trask, J. D., and Webster, L. T.: Isolation of Poliomyelitis Virus from the Nasopharynx, J. Exper. Med. **62:** 245 (Aug.) 1935.

15. Kramer, S. D.: Detection of a Healthy Carrier of Virus of Poliomyelitis Without History of Contact, Proc. Soc. Exper. Biol. & Med. **32:** 1165 (April) 1935.

16. These references include:

(*a*) Shaughnessy, H. J.; Harmon, P. H., and Gordon, F. B.: The Neutralization of Poliomyelitis Virus by Human Serum, J. Prev. Med. **4:** 463 (Nov.) 1930.

(*b*) Aycock, W. L., and Kramer, S. D.: Immunity to Poliomyelitis in Normal Individuals in Urban and Rural Communities as Indicated by the Neutralization Test, ibid. **4:** 189, 201 (May) 1930.

(*c*) Fairbrother, R. W., and Brown, G. G. S.: The Action of the Serum of Normal Individuals on the Virus of Poliomyelitis, Lancet **2:** 895 (Oct. 25) 1930.

(*d*) Faber, H. K.: Transfusion Donors as Sources of Immune Serum for Treatment of Poliomyelitis, J. A. M. A. **96:** 935 (March 21) 1931.

(*e*) Schultz, E. W., and Gebhardt, L. P.: Incidence of Normal Persons Possessing Demonstrable Antibodies for Poliomyelitis Virus in Their Serum, Proc. Soc. Exper. Biol. & Med. **28:** 409 (Jan.) 1931.

(*f*) Kramer, S. D., and Aycock, W. L.: Abortive Poliomyelitis, ibid. **29:** 98 (Oct.) 1931.

(*g*) Brodie, Maurice: A Comparison Between Convalescent Serum and Nonconvalescent Serum in Poliomyelitis, J. Exper. Med. **56:** 507 (Oct.) 1932.

(*h*) Jungeblut, C. W.: The Power of Normal Human Sera to Inactivate the Virus of Poliomyelitis in Its Relation to Blood Grouping and to Exposure, J. Immunol. **24:** 157 (Feb.) 1933.

(*i*) Kolmer, J. A.; Klugh, G. F., and Rule, Anna M.: A Successful Method for Vaccination Against Acute Poliomyelitis, J. A. M. A. **104:** 456 (Feb. 9) 1935.

(*j*) Brodie, Maurice, and Park, W. H.: Active Immunization Against Poliomyelitis, J. A. M. A. **105:** 1089 (Oct. 5) 1935.

(*k*) Kolmer, J. A.: Susceptibility and Immunity in Relation to Vaccination in Acute Anterior Poliomyelitis, J. A. M. A. **105:** 1956 (Dec. 14) 1935.

17. Amoss, H. L., and Taylor, E.: Neutralization of the Virus of Poliomyelitis by Nasal Washings, J. Exper. Med. **25:** 507 (April) 1917. Flexner, Simon, and Amoss, H. L.: Experiments on the Nasal Route of Infection in Poliomyelitis, ibid. **31:** 123 (Feb.) 1920; Harmon, P. H.: Unpublished experiments.

of three groups of investigators [18] of the experimental disease. Application of these measures for prophylaxis in man awaits only the opportunity. While there are other physiologic factors of resistance to this disease (reviewed by Hudson, Lennette and Gordon [19]), there are no other practical measures as yet suggested that are likely to be of value in the disease of man except the application of specific therapy.

The question of whether the disease and the infectious agent are entirely confined to the nervous system is of importance in the development of specific immune bodies, the virus neutralizing substances. There is evidence that the virus is encountered in the blood or cerebrospinal fluid only irregularly.[20] Thus, the barrier that exists between the blood vascular system and the nervous system keeps the virus in the latter area. Lennette and Hudson [21] have shown that transportation of the virus into the susceptible nervous system can occur after intravenous injection only when the virus is excreted onto the nasopharyngeal mucosa or when a freshly severed nerve is available. That visceral spread of the virus does take place is seen in the finding of the virus in the perfused spleen during convalescence.[19] Previous failures [20] to detect the virus in extraneural locations are perhaps due to the presence of virus-neutralizing substances in the blood, a point brought out by Lennette and Hudson.[21] Irregular extraneural outflow of the virus during the acute disease accounts for the variable appearance of neutralizing antibodies in convalescence (as already shown), which remains one of the startling peculiarities of this disease.

THE ORIGIN AND SIGNIFICANCE OF THE VIRUS-NEUTRALIZING ANTIBODIES

The blood of a surprising percentage of human and monkey convalescents seems to be devoid of neutralizing substances, a fact that has been masked by the earlier workers, who have made only a few observations in the recovery state. Only recently has the blood of a large number of human convalescents been examined and the full force of this fact become evident. These observations are summarized in table 1. The percentage of convalescents without neutralizing substances in the blood varies from 12.1 to 64.1. The latter group was thought to be exceptional because they were treated in the acute stage with convalescent and antiviral animal serums. Of the total of 183 human convalescents, 39.8 per cent were without antibody. Jungeblut and Smith [22] have advanced evidence to show that the ability to form antibody both after an attack of poliomyelitis and in those without history of exposure is linked with blood type, group A having this property in least degree while group B contains the greatest number of individuals with neutralizing properties.

On the other hand, a larger percentage of adults, drawn at random from the populace and who have had no obvious exposure to the disease, carry neutralizing substances in the blood stream against the virus. The incidence of antibody in this group ascends with increasing age. This fact led Shaughnessy, Harmon and Gordon [16a] and Aycock and Kramer [16b] to draw analogy to diphtheria and to postulate repeated subclinical exposure to the virus. The presence of these neutralizing substances was interpreted by these authors and many others as signifying the immune state. That such a hypothesis will stand in the face of the newer ideas of tissue versus humoral immunity is questionable. As quantitative data accumulate, the analogy to diphtheria may be drawn even more closely, as it is well known that a certain percentage of Schick negative individuals are susceptible to clinical diphtheria. Table 2 gives the number of "normal" persons, by age groups, who have been found to contain virus-neutralizing antibodies in the blood. We have purposely omitted reference to those who have examined only a few serums, as even the numbers quoted are not of far reaching statistical significance.

TABLE 1.—*Convalescence from Poliomyelitis (Man) Without Neutralizing Antibody in the Blood*

	Serums Tested	Per Cent Negative
Aycock and Kramer [16b]	41	12.1
Schultz and Gebhardt [16c]	4	50.0
Shaughnessy, Harmon and Gordon [16a]	14	42.9
Howitt, Beatrice: J. Infect. Dis. **51**: 565, 1932; personal communication	41 (untreated) 39 (serum treated)	51.2* 64.1*
Jungeblut and Smith [22a]	26	42.3
Stokes, J., Jr.; Wolman, I. J.; Carpenter, H. C., and Margolis, J.: Am. J. Dis. Child. **50**: 581, 1935	7	28.5
Harmon, P. H.; Harkins, H. H.; Fahey, J. J., and Wasbotten, P. M.: Proc. Soc. Exper. Biol. & Med. **34**: 585, 1936	11	27.2
Total	183	
Average		39.8†

* This percentage is slightly greater than the figures given by Howitt by virtue of our including, as negative serums, those which prolonged the incubation period. Such a phenomenon has been interpreted as "partial neutralization" by certain authors. We do not favor such an interpretation.

† These data are not suitable for analysis by age group, as they are abnormally weighted with adults.

No difference has yet been elicited between the virus-neutralizing antibodies of "normal" human blood and those of convalescence.[23] Although identical, as far as we know, there is a division in opinion as to their origin. Most investigators believe them to be the result of specific contact with subinfective doses of virus, but another group holds that physiologic factors of growth, maturation and menstruation as induced by endocrine activity are responsible for the production of some of the neutralizing substances (reviewed by Jungeblut and Engle [24]). Hudson, Lennette and King [25] have failed, however, to verify the experimental data on which the

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19. Hudson, N. P.; Lennette, E. H., and Gordon, F. B.: Factors of Resistance in Experimental Poliomyelitis, J. A. M. A. **106**: 2037 (June 13) 1936.

20. Poliomyelitis, the International Committee for the Study of Infantile Paralysis, Baltimore, Williams & Wilkins Company, 1932.

21. Lennette, E. H., and Hudson, N. P.: The Blood Central Nervous System Barrier in Experimental Poliomyelitis, Proc. Soc. Exper. Biol. & Med. **34**: 470 (May) 1936.

22. (*a*) Jungeblut, C. W., and Smith, L. W.: Blood Grouping in Poliomyelitis: Its Relation to Susceptibility and the Neutralizing Property of Convalescent Sera, J. Immunol. **23**: 35 (July) 1932. (*b*) Jungeblut.[16b]

23. (*a*) Weyer, E. R.; Park, W. H., and Banzhaf, E. J.: A Potent Antipoliomyelitic Horse Serum Concentrate and Its Experimental Use in Infected Monkeys, J. Exper. Med. **53**: 553 (April) 1931. (*b*) Jungeblut, C. W.: The Immunological Characteristics of the Poliocidal Substance in Human Serum, J. Immunol. **27**: 17 (July) 1934. (*c*) Schultz, E. W.; Gebhardt, L. P., and Bullock, L. T.: Studies on the Antigenic Properties of the Ultraviruses: VII. Nature of the Viricidal Antibody in Antipoliomyelitis Serum, ibid. **21**: 171 (Sept.) 1931.

24. Jungeblut, C. W., and Engle, E. T.: Resistance to Poliomyelitis: The Relative Importance of Physiologic and Immunologic Factors, J. A. M. A. **99**: 2091 (Dec. 17) 1932; An Investigation into the Significance of Hormonal Factors in Experimental Poliomyelitis, J. Exper. Med. **59**: 43 (Jan.) 1934.

25. Hudson, N. P.; Lennette, E. H., and King, E. O.: Failure to Neutralize the Poliomyelitis Virus with Sera of Adult Macacus Rhesus and of Young Female Rhesus Treated with Anterior Pituitary Extracts, J. Exper. Med. **59**: 543 (May) 1934.

latter theory rests. In short, they have been unable to find neutralizing substances in mature male or female monkeys or in females rendered artificially mature by treatment with extracts of anterior pituitary. The known slight resistance of adult monkeys to cerebral infection,[24] like the resistance of the New World monkey [26] and lower species of mammalia,[27] remains unexplainable by humoral factors. Epidemiologic facts point to lessened chance for contact infection of adults in poliomyelitis as well as in other infectious diseases (measles and scarlet fever [28]), since significant numbers of adults contract the disease only after the epidemic is under way.[29]

That contact with virus is alone the stimulation for antibody production has been largely borrowed by analogy to the experimental disease. Kramer [30] and Fairbrother and Brown [16c] have placed on record actual instances in man in which contact with the disease led to the production of immune substance, while Trask and Paul [31] have made similar observations on the abortive types of the disease. Whether inflammatory involvement of the nervous system is present in the latter types is not known. If absent, as some believe, there is stimulation of antibody production by extraneural virus. The opposite view that the abortive and nonparalytic types of the disease are a result of an adequate amount of preinfection antibody (for the current attack) is postulated by observations made by Eagles [32] on serum pools from these three types of the disease used for treatment in the 1934 epidemic in Denmark, and by our titrations of serum during and after an attack.

The strongest argument against the need of a specific stimulus for production of virus neutralizing antibodies is the finding by Jungeblut [23b] of their presence in commercial serums of such variable origin as diphtheria antitoxin, antivenoms, antistreptococcus serums and the serums from pregnant mares. Confirmation and extension of these tests are urgently needed. The origin of the virus-neutralizing principle in human placental extracts [33] is not certain.

A peculiarity of the virus of poliomyelitis that requires some comment at this point is its weak antigenicity. While antibodies and solid immunity are readily produced by nasal spraying with other viruses (e. g., St. Louis encephalitis and louping ill [34]), similar experiments with susceptible monkeys do not even lead to the development of virus-neutralizing substances in the blood.[35] Subinfective or modified virus given by the subcutaneous route seldom leads to immunity against intracerebral or intranasal infective doses, although virus-neutralizing substances are produced, particularly if repeated doses of the immunizing preparation are given (reviewed by Olitsky and Cox [36] and Gordon [37]). Even the vaccines, lately in use, have not yielded experimentally significant quantities of humoral antibody in the hands of all workers.[38] The underlying cause of this poor antibody response may be the lack of antigenic mass, it being well known that many viruses remain active in logarithmic dilutions (vaccinia, herpes, St. Louis encephalitis), while the poliomyelitis virus rapidly becomes subinfective on dilution.

TABLE 2.—*Normal Persons with Neutralizing Antibodies for Passage Strains or Poliomyelitis Virus*

	Age Groups							
	0-4 Years		5-9 Years		10-14 Years		15 Years	
	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent
Aycock and Kramer [16b]	16*	31	18*	44	17	47	45	77
Kramer and Aycock [16f]	..	..	88 (5-15 years)		44		..	..
Shaughnessy, Harmon and Gordon [16a]	5†	40	10 (4-11 years)		60		10	90
Faber [16d]	..	..	..		..		10	77
Weyer, Park and Banzhaf [23]	..	..	..		..		9	66
Schultz, E. W.: J. Pediat. 1: 358, 1932	..	..	..		..		53	55
Brodie [16g]	..	..	..		..		29	75
Jungeblut [23b]	..	..	..		..		30	57
Hudson and Litterer, quoted by International Committee for the Study of Infantile Paralysis [20]	..	..	..		..		25	84
Kolmer [16k]	9	22	20 (5-14 years)		60		..	..
Howitt (quoted by Kolmer [16k])	..	..	..		..		24	66
Brodie and Park [16j]	50 (0-5 years)	54	10 (6-10 years)		90		34	80
Totals	80		163				269	
Average		37			58			73

* 0-9 year groups included twelve rural children, none of which neutralized. Tests on twelve infants also reported by these authors (J. Exper. Med. **52**: 457, 1930) but not included in the above. Ten (83 per cent) neutralized.

† Including two infants, both neutralized.

While other viruses develop complement fixing, precipitating and agglutinating antibodies (review by Rivers [39]), it has now become well established by reports of exhaustive work from several laboratories [40] that the neutralizing substance is the only antibody associated with contact or infection with the poliomyelitis virus. Skin tests for susceptibility have likewise been negative in the hands of most workers in this field.[41]

26. MacKay, E. M., and Schroeder, C. R.: Resistance of the Spider Monkey (Ateles Ater) to Infection with the Virus of Acute Anterior Poliomyelitis, Proc. Soc. Exper. Biol. & Med. **33**: 373 (Dec.) 1935.

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30. Kramer, S. D.: Immunity to Poliomyelitis in the General Population, J. A. M. A. **99**: 1048 (Sept. 24) 1932.

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32. Eagles, G. H., cited by Jensen.[29]

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NEUTRALIZING ANTIBODIES DURING THE ACUTE DISEASE AND DURING CONVALESCENCE

From the foregoing account it is clear that neutralizing substances are developed more or less regularly in response to the artificial introduction of virus either into or beneath the skin. Brodie [42] has already reported that under such conditions the response exceeds that produced by an attack of the experimental disease. The full implication of such facts is not apparent, because there has never been an adequate survey made of the behavior of the neutralizing substances after either the experimental disease or the acute disease of man. This author's experiments indicate that neutralizing substances are present in the blood stream ten days after a single injection into the skin but do not reach their height until ten days later. While Kolmer, Klugh and Rule [16] have been able to demonstrate neutralizing antibody as early as four days after their first immunizing injection, their experience is exceptional in the general field of the viruses, since, as a rule, neutralizing antibodies are not demonstrable until a week after the onset of the acute disease, or from ten to fourteen days after experimental inoculation.

TABLE 3.—*Neutralization of Virus by Serum Early in Poliomyelitis in Comparison to the Convalescent State*

Patient	Age	Blood Group	Clinical Data	Day of Paralysis on Which Blood Was Taken	Ten Paralyzing Doses of Virus Neutralized by Serum in Dilution of: Initial Sample	Later Sample	Time, Months
Convalescent Serum Given Prior to Taking Blood Sample							
D. N.	8	AB	Initial leg weakness; full recovery	6th	1:10	*	..
J. H.	12	AB	Extensive residual paralysis in both legs and hips	5th	1:2	1:5	6
P. J.	2	A	Paralysis of both legs; residual in one leg	5th	1:1	0†	4
L. P.	8	AB	Bulbar with palatal paralysis	5th	1:5	*	..
E. S.	10	O	Paralysis of one arm and both legs; residual one hip and quadriceps	7th	1:1	1:2	3
M. H.	7	O	Paralysis of both legs; residual both calves	5th	1:2	1:2	3
D. R.	14	O	Paralysis of both legs and one arm; residual legs, hips and lower spine	4th	1:5	0	3
No Serum or Serum Given After Blood Sample							
B. W.	9	AB	Patchy paralysis of both legs and arms; residual weakness in legs	12th	1:100+	1:100+	5
D. B.	11	A	Nonparalytic	5th‡	1:100+	1:100+	5
L. S.	3	O	Paralysis of one leg; residual one calf group	9th	1:2	1:2	3
R. S.	8	AB	Loss of knee jerks with paresis; no residual paralysis or weakness	6th‡	0	0	4
B. R.	12	B	Paralysis of one leg; residual one foot	7th	0	*	..
W. R. C.	45	AB	Preparalytic; residual paresis in both arms and one leg	§	1:20	1:80	3
S. S.	6	AB	Paralysis of one leg; residual drop foot	6th	1:1	1:1	4

* Second blood sample not obtained.
† 1:1 failed to neutralize; 1:5 neutralized; latter probably a false positive.
‡ Nonparalytic case; date on which serum was drawn was the number of days after the onset of temperature.
§ Blood obtained one day before the onset of paralysis.

It was our opinion that observations should be made on the level of neutralizing antibody as early as possible in the acute disease in man, and again later in the same cases in order to determine the actual effect of an attack of the disease on the level of neutralizing substance. Antibody level should, if possible, be correlated with the outcome of the disease to see whether there is a level that will determine a nonparalytic or mildly paralytic form of the disease. Table 3 summarizes the results of in vitro neutralization tests on the serums of fourteen patients [43] during an acute attack of the disease. Only eleven serums were available for testing from three to five months later. One patient,[44] an adult, was observed to have a greater than average amount of neutralizing substance even twenty-four hours before the onset of paralysis. This observation appears to be the first on record of evolution of paralysis in man in the presence of neutralizing antibody. Seven of these cases were purposely selected after convalescent serum had been administered to see what effect, if any, the administration of such low titer serums had on the antibody level during the acute stage. The effects of passive transfer were in unmistakable evidence in only one patient (D. R.), but he had received 80 cc. of serum on two occasions only three days and one day before the first blood sample was drawn. From the fact that three months later he was entirely without neutralizing antibody suggests that none was present prior to the attack. The severity of the disease and the amount of recovery (inversely proportional to the degree of permanent motor nerve cell damage) have no correlation with the level of immune substance either during the attack or during convalescence. It is quite unlikely that the high level of immune substance in patients B. W., D. B. and W. R. C. was the result of the current attack. The series, as a whole, implies that the disease may evolve in the presence of neutralizing antibody. This is quite clear in the instance of W. R. C., from whom serum was taken a day prior to paralysis. That a disease may occur while circulating antibody is present in the blood stream is not a novel conception, as such observations have been made both within [45] and without [46] the virus field. On the other hand, patients P. J., R. S. and B. R. demonstrate very little or no antibody in the blood at any time, yet the severity of the disease and the amount of permanent motor damage is not greater than in other cases of the series.

That the amount of neutralizing substance found in the early samples is the direct effect of the current attack is minimized by the irregular appearance of immune substance following the experimental disease induced by intracerebral inoculation in monkeys. In similar in vitro neutralization tests on monkey serums made in parallel with the foregoing observations in

42. Brodie, Maurice: The Rate of Antibody Formation in Monkeys Actively Immunized with Poliomyelitis Virus, J. Immunol. **27**: 395 (Oct.) 1934.

43. We are indebted to the Illinois State Department of Health (Dr. Frank J. Jirka, director) for early reporting of cases and aid in securing these blood specimens. We also acknowledge the cooperation of the following physicians: Dr. W. G. Wallace, Mattoon, Ill.; Dr. H. O. Carlton, West Frankfort, Ill.; Dr. C. D. Swickard, Charleston, Ill.; Dr. J. S. Terrando, LaSalle, Ill.; Dr. L. C. Harlan, Madison, Ill.; Drs. W. A. Frymire and J. L. Sherrick, Monmouth, Ill.; Dr. E. P. Russell, Berwyn, Ill.: Dr. A. G. Everhardt, Buda, Ill.; Dr. A. M. Everhart, Sheldon, Ill., and Dr. L. E. Tegtmeier, Millstadt, Ill.

44. For the samples of blood from the preparalytic case we are indebted to Dr. M. A. Gifford of Bakersfield, Calif.

45. Olitsky and Cox.[36] Gordon.[37] Rivers.[39] Howitt, B. F.: Equine Encephalomyelitis, J. Infect. Dis. **51**: 493 (Nov.-Dec.) 1932. Andrewes, C. H.; Laidlaw, P. P., and Smith, W.: Influenza: Observations on the Recovery of the Virus from Man and on the Antibody Content of Human Sera, Brit. J. Exper. Path. **16**: 566 (Dec.) 1935. Francis, T., Jr., and Magill, T. P.: Vaccination of Human Subjects with Virus of Human Influenza, Proc. Soc. Exper. Biol. & Med. **33**: 604 (Jan.) 1936.

46. Robertson, O. H.; Terrell, E. E.; Graeser, J. B., and Cornwell, M. A.: The Relation of Natural Humoral Antipneumococcal Immunity to the Inception of Lobar Pneumonia, J. Exper. Med. **52**: 421 (Sept.) 1930.

human cases we found neutralizing antibody not to occur until the sixth to the fourteenth day after paralysis, and then irregularly. Even after neutralizing substances were once present in a given animal they were absent on a later date in four of six instances. No neutralizing substances were observed at any time during ten days after the onset of paralysis in three of seven animals. One animal acquired these substances between the third and the eighth week after paralysis. Such results were independent of the test dose of virus used (three and ten paralyzing doses). Essentially the same facts were recently reported by Jungeblut [47] with similar materials. In this investigator's hands, two of three animals had no neutralizing substance two weeks after paralysis, three of six had none after a month, and two of six had none after two months. In spite of the lack of humoral antibody, none were affected by intracerebral reinoculation with a heavy dose of virus (five of eleven having no antibody at the time of retest). It thus appears that resistance to intracerebral reinoculation, which is universal in convalescent monkeys, does not depend on humoral antibody. In this connection, the experiments of Paul and Trask,[48] who showed monkeys to be susceptible to cerebral reinoculation by a recently adapted human virus when convalescent from an attack conferred by a passage strain and the converse, should be recalled. Some degree of evanescent cross immunity was, however, observed by them.

SIGNIFICANCE OF NEUTRALIZING ANTIBODIES IN SERUM THERAPY

That convalescent or other serum modifies the natural course of human poliomyelitis has yet to be conclusively proved (reviewed by Harmon [49]). Evaluation of the many observations in this field are fraught with difficulty, since the severity and types of the acute disease vary from epidemic to epidemic and even in the same epidemic. Statistical analysis of certain large epidemics has failed to elicit favor for convalescent human serum, except that the earlier the serum is used in the acute stage the less is the incidence of either acute or residual paralysis.[50] Clinical observations that have been made by almost every group that has applied convalescent human serum of a rapid response by a drop in temperature and improvement in symptoms cannot be disregarded. It is questionable whether treatment of one group of cases with serum, withholding it from others, has been justifiable from either the administrative or the scientific point of view.

Experimental monkeys cannot be used to evaluate a serum to be applied in the human disease, since for reasons as yet poorly understood the disease of these animals is fulminating. The endemic types of the human disease are especially unlike the experimental counterpart, the former having a smoldering and often nonparalytic course. We [49] have pointed out that from 70 to 80 per cent of cases reported in epidemics before 1933 have been nonparalytic types. In certain recent epidemics,[51] less than 10 per cent of the patients have been paralyzed at any time. It is entirely probable that the preparalytic cases are seen in this stage because they are mild cases. For example, the general mortality in the epidemic of 1931 in New York City [52] was 12.2 per cent, while among the preparalytic cases in which no serum was given the mortality rate was only 0.9 per cent. Attempts at evaluation of the effect of convalescent serum in the established disease of monkeys either in the preparalytic stage or in the stage of manifest paralysis have uniformly denied any effect of the serum on the course of the disease,[53] even when an exceptionally high titer antiviral horse serum was used.[54] The later experiments on prophylaxis by Schultz and Gebhardt,[55] who raised the level of immune substance in recipient monkeys by passive transfer of neutralizing substances to at least the average level of pooled convalescent human serum, demonstrated that such a procedure allowed 30 per cent survival as contrasted with only 7 per cent in untreated controls. They concluded that the extent of paralysis in poliomyelitis was determined by the general level of natural resistance possessed by neurons (tissue immunity) or by the virulence of the infecting virus strain.

In vitro experiments have been performed recently which show that once virus (vaccinia and Shope fibroma) [56] has combined with living cells it cannot be neutralized by immune serum. Virus within dead cells can be effectively neutralized. This finding is a disappointing paradox, and, if directly applicable to conditions within the body in poliomyelitis, serum is often too late to preserve susceptible cells unless given before virus-cell union occurs. On the other hand, it is possible that intersegmental spread of virus does take place even after the first paralysis appears. Theoretically, then, it is possible that serum is of value in early paralysis, when end results are compared. There are many difficulties in settling such a question practically. End results have not even been adequately determined after serum has been administered in the preparalytic period in conjunction with adequate orthopedic aftercare.

Reference should not be omitted to the results of treatment with convalescent human serum to be found in recent reports. Tebbutt and Helms [50] observed a lower mortality in the cases treated in the preparalytic stage of 3.3 per cent as contrasted with 11.8 per cent in the untreated controls seen after paralysis was present. Again in this report there was evidence that the preparalytic cases presented milder paralysis and a longer preparalytic period. Jensen [29] thought that the earlier after the onset of symptoms that treatment was applied, the less the incidence of paralysis. If applied three days or more after the onset of symptoms in the preparalytic period, there was little difference in the percentage developing paralysis. Cowie and his co-workers [57] have reported no residual paralysis in eighty preparalytic cases treated with both human convalescent serum and transfusions from normal adults. There was but one paralytic case observed in

47. Jungeblut, C. W.: On the Mechanism of Immunity in Experimental Poliomyelitis, J. Infect. Dis. **58**: 150 (March-April) 1936.

48. Paul, J. R., and Trask, J. D.: A Comparative Study of Recently Isolated Human Strains and a Passage Strain of Poliomyelitis Virus, J. Exper. Med. **58**: 513 (Nov.) 1933.

49. Harmon, P. H.: Poliomyelitis: I. Experimental and Theoretical Basis for Serum Therapy; A Review: II. Results of Treatment in the Acute Disease; Analysis of Reports on 4,400 Patients Treated with Serum, Am. J. Dis. Child. **47**: 1179 (June) 1934.

50. Jensen.[29] Tebbutt, A. H., and Helms, K.: A Report of the Epidemic of Poliomyelitis in New South Wales 1931-1932, M. J. Australia **20**: 43 (Jan. 14) 1933.

51. Jensen.[29] Symposium on 1934 Epidemic of Poliomyelitis in California, Am. J. Pub. Health **24**: 1197 (Dec.) 1934.

52. Park, W. H., quoted by Brodie.[53]

53. Gordon.[57] Brodie, Maurice: The Rôle of Convalescent Serum in Preparalytic Poliomyelitis, J. Immunol. **28**: 353 (May) 1935.

54. Schultz, E. W., and Gebhardt, L. P.: Observations on the Therapeutic Value of Specific Immune Serum in Experimental Poliomyelitis, J. Pediat. **6**: 615 (May) 1935.

55. Schultz, E. W., and Gebhardt, L. P.: Observations on the Prophylactic Value of Specific Immune Serum in Experimental Poliomyelitis, J. Pediat. **7**: 332 (Sept.) 1935.

56. Rous, Peyton; McMaster, P. D., and Hudack, S. S.: The Fixation and Protection of Viruses by the Cells of Susceptible Animals, J. Exper. Med. **61**: 657 (May) 1935.

57. Cowie, D. M.; Parsons, J. P., and Lowenberg, K.: Clinicopathologic Observations on Infantile Paralysis: Report of 125 Acute Cases with Special Reference to the Therapeutic Use of Convalescent and Adult Blood Transfusions, Ann. Int. Med. **8**: 521 (Nov.) 1934.

this series; this rapidly cleared. Symptomatic improvement was noted even in certain paralytic cases. Lastly, Levinson [58] has treated 149 preparalytic cases of the seasonal endemic type of poliomyelitis in Chicago during the past four years. He states that the incidence of paralysis has been negligible and that most of the temporary weakness disappeared later. He too has been impressed by the amelioration of symptoms in both the preparalytic group and the paralytic cases presenting smoldering fever or acute recrudescence.

As specific treatment is continued during the next few years, the efficacy of concentrates from antiviral animal serums having advanced neutralizing potency should be evaluated. Titrations of pools of convalescent serums show only a moderate amount of neutralizing antibody. It is possible that tested human convalescent serum or normal human serum of high antibody content would be more effective in practice. Another source of antipoliomyelitis neutralizing substance that may be available for human therapy is human placental extracts.[33] We have recently determined that these preparations contain more neutralizing antibody than the average of convalescent serum pools.

SUMMARY

The peculiar pathogenesis of poliomyelitis as an exclusive disease of the nasopharynx and nervous system with irregular extraneural outflow of virus explains the variability of production of neutralizing antibody in both the experimental disease and the human disease. Blockage of infection at the port of entry by application of chemicals has been recently demonstrated in three widely separated laboratories. This method may have some value in prophylaxis against the disease of man.

The specific virus-neutralizing substance in poliomyelitis is unique in that greater numbers of adults without history of contact or infection possess these substances than convalescents from the disease. The average concentration of immune substance in normal adults is equal to or greater than that carried by convalescents. The importance of an actual attack of poliomyelitis in the production of these substances is minimized by our serologic studies. The rôle and mechanism of the tissue immunity that exists in this disease has not been elucidated.

Convalescent and other specific serum therapy should be continued, as there is no evidence that it is not of value. On the other hand, symptomatic improvement following the administration of serum is almost universal. There are indications that preparalytic poliomyelitis in man is a naturally milder type of the disease than the cases seen after paralysis is present.

ABSTRACT OF DISCUSSION

DR. SYDNEY O. LEVINSON, Chicago: This paper discloses a comprehensive analysis of a field in which there is much conflicting evidence and thought. It also presents some disconcerting conclusions. It is a pardonable hope that new evidence will provide an answer to some of the unexplained aspects of the disease. However, even though it does not conform with the accepted view, any sincere study must be taken seriously and the evidence examined critically. The authors raise the question whether man ever acquires an effective immunity from an attack. Shouldn't the wording of this question be "whether man always acquires an immunity"? The very fact that only seventeen secondary cases have been reported in a group of 150,000 paralytic cases emphasizes the rarity of second attacks in formerly susceptible individuals and justifies the conclusion that a very high percentage are immune. Such a conclusion is justified, unless it is assumed that they were not reexposed, an unlikely supposition in the face of the widespread dissemination of the virus. This is supported by the resistance to reinfection in the experimental animal recovered from a previous infection. The neutralization studies in various stages of poliomyelitis lead the authors to believe, first, that an attack of the disease does not seem to increase the poliocidal bodies, and, secondly, that there does not seem to be any relation between the presence of these bodies and resistance or susceptibility to an attack. Before one concurs in these opinions, a few commonly accepted facts must be reviewed. 1. Neutralizing substances in monkey's serum are found only after an attack of the disease or some immunizing procedure. 2. The relative immunity in adults is accompanied by the greatest frequency of virus neutralizing substances. 3. Limited observations reveal that most infants possess virucidal substances in their serum—undoubtedly a passive transfer from the mother—and the disease is relatively uncommon in infants. 4. Other studies show that the frequency of the disease in different age groups parallels the frequency of antibody deficient serums in these groups. 5. Passive immunization of monkeys tends to protect the animals against the virus. I should like to know whether I gained the correct impression that those patients showing an appreciable amount of poliocidal substance had no severe or extensive paralysis. How can these two divergent views be reconciled? The answer may lie in the authors' own conclusion that immunity to the disease resides in many factors, tissue and humoral, specific and nonspecific resistance. I believe it would be a mistake to ignore any single factor. I would stress that in this disease, as in others, the amount of the infecting dose may bear a definite influence on the severity of the infection. Whereas in monkeys the infecting dose can be controlled, in man it is an uncertain and indeterminate quantity. It is a factor that must be given due consideration in the analysis of any small group of human cases. This study is valuable in pointing out that poliocidal substances in the blood stream cannot be taken as the sole criterion of immunity against the disease. Their significance may have been overemphasized in the past, but I question the wisdom of ignoring them in the future. Further investigation may reveal a quantitative relationship in man between poliocidal substances and resistance to infection. There is urgent need for further work along these lines, because of their importance in the problems of active immunization.

DR. PAUL H. HARMON, Chicago: In the past ten years, at least six groups of investigators have at some time or other, in the laboratory at least, had a vaccine ready for human application. The deterring fact which prevented these investigators from applying their results to man was that paralysis was produced by the vaccine in from 10 to 20 per cent of experimental monkeys. Only a few of these monkeys were resistant to intracerebral inoculation. Recently Gordon, at the University of Chicago, has carried out quite an extensive study on vaccination in monkeys. Although he could induce neutralizing substances by virus absorbed to alumina gel, very few of these so-called immunized monkeys were resistant to intranasal application of active virus. In fact, more than 80 per cent came down with the typical disease following such a test. I think it can be stated that the serum is of some value in the treatment. While I do not have the opportunity of quoting some of the recent reports of treatment of the disease in man, I can mention the recent experiments of Schultz at Stanford University, who showed that there is definite protection of a small percentage of monkeys by serum given before the virus test. I didn't want to be so pessimistic as to state that no individual ever becomes immune to poliomyelitis. I simply wanted to show the figures to bring up the question to see what others think about this question. It is questionable whether or not the figures are statistically significant. In going over 300 or 400 of our cases of paralysis at the University of Chicago I found two cases in which there had been two separate and distinct attacks of poliomyelitis several years apart. I imagine that, if any large orthopedic clinic would review its cases, similar facts would be found. For example, Cohen at the University of Iowa reported two such cases.

58. Levinson, S. O.: A Five Year Review of Anterior Poliomyelitis in the Chicago Area, Illinois M. J., to be published.

UNDULANT FEVER

FURTHER EPIDEMIOLOGIC AND CLINICAL OBSERVATIONS IN IOWA

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The data comprising this report were accumulated during the period 1930 to 1935 inclusive. The observations include (1) bacteriologic and serologic studies in the Iowa State Hygienic Laboratories; (2) special reports on 705 cases submitted by attending physicians to the Division of Communicable Diseases and Epidemiology, Iowa State Department of Health; (3) personal observations and detailed records of cases presenting unusual clinical features, chiefly patients admitted to the State University Hospitals, and (4) comparative data collected from the different states through the office of the director of the National Institute of Health, Washington, D. C. Certain observations in our reported series of 375 cases for the period 1927 to 1929 are also considered. Supplementary information was also drawn from the current literature.

ETIOLOGY

The various strains of Brucella isolated from patients in Iowa for the nine years 1927 to 1935 numbered 127 (table 1). All but ten of the organisms were obtained from blood cultures. The other sources were feces (one), urine (two), spinal fluid (two), pleural fluid (one), cervical lymph glands (one), purulent discharge from osteomyelitis (two) and purulent discharge from spondylitis (one). The organism from the spondylitis was a bovine strain; the nine others were porcine. The one melitensis variety was obtained from an infection apparently acquired in Mexico. From this case the bovine variety was simultaneously isolated. In another Iowa case mixed infection with bovine and porcine varieties was demonstrated. In a third individual Brucella suis was obtained both from blood culture and from a suppurative osteomyelitis of the wrist. Thus the 127 organisms were obtained from 124 cases.

Comparable cultural studies have been carried out in but few other states. The limited observations clearly indicate markedly different results in different areas. In New York State, for example, a total of fifty-one strains have been isolated and forty-one have been classified. Of the latter, thirty-six (92.7 per cent) were bovine, one (2.4 per cent) was porcine, and two (4.9 per cent) were melitensis. The two melitensis strains were from an imported case and a laboratory infection.

The significance of differences in the prevailing variety of Brucella has been more clearly established by the occurrence of two milk-borne epidemics of undulant fever due to the porcine strain. In the Iowa outbreak reported by Beattie and Rice,[1] within a period of three months among approximately 350 regular patrons of a raw milk dairy there occurred twenty-seven rather severe cases of undulant fever, an attack rate of 7.7 per cent or an annual rate of 30.8 per cent. Similarly, in Connecticut within a period of nine months Horning[2] observed thirteen cases, with three deaths, in an institution having a population of 386, an annual attack rate of 4.8 per cent. In contrast with these relatively high rates, the average annual attack rate for persons in Iowa using raw milk from dairy herds infected with the bovine strain of Brucella has been not over 0.02 per cent. It is apparent that the hazard of exposure to the porcine is far greater than like exposure to the bovine strain. A comparison of the clinical records of the cases giving positive cultures has also shown that those due to the porcine variety almost invariably were particularly protracted and severe. In pathogenicity and infectivity the porcine appears to be similar to the melitensis variety, both differing markedly from the widely disseminated bovine strains. Thus variation in incidence and clinical characteristics, dependent on the distribution of these three strains, is to be expected.

INCIDENCE OF BRUCELLA INFECTIONS

For the United States as a whole the number of reported cases of undulant fever has rather steadily increased from twenty-four in 1925 to 1,897 in 1935 (table 2). According to the data provided by the various state departments of health, reported cases represent about 75 per cent of the number indicated by positive agglutination tests. Thus there have recently been 1.5 reported and about two diagnosed cases of undulant fever per hundred thousand of population annually. The known incidence, however, varies widely. States with two or more officially reported cases per hundred thousand of population are shown in chart 1. It is to be noted that Iowa has the highest attack rate, being closely followed by adjoining states. Judging by the number of cases presenting positive laboratory signs, Iowa actually had a substantially higher rate, 8.7 per hundred thousand of population. Although New York State now has the largest number of reported cases annually, the higher "up-state" attack rate is less than one-half that in Iowa.

TABLE 1.—*The Varieties of Brucella Isolated from Cases of Undulant Fever in Iowa*

Variety of Brucella	Number and Percentage of Organisms Isolated					
	1927–1929		1930–1935		Total	
	Number	Per Cent	Number	Per Cent	Number	Per Cent
Porcine.....	35	71.4	53	67.9	88	69.3
Bovine.....	14	28.6	24	30.8	38	29.9
Melitensis.....	0	00.0	1	1.3	1	0.8
Total.....	49	100.0	78	100.0	127	100.0

For comparative purposes we have calculated the known incidence of undulant fever by regions and have related these to possible determining factors (table 3). The high rate for the West North Central states as compared with other sections is outstanding. It is probable that this difference would be accentuated by more complete reporting of diagnosed cases. The low rates in the largely rural South Central states are also noteworthy.

Data are now available which permit a comparison of the incidence of infection in cattle and in man.

Read before the Section on Practice of Medicine at the Eighty-Seventh Annual Session of the American Medical Association, Kansas City, Mo., May 13, 1936.

This study was conducted under the joint auspices of the United States Public Health Service, the Iowa State Department of Health and State Hygienic Laboratories, and the De Lamar Institute of Public Health, Columbia University, New York.

1. Beattie, C. P., and Rice, R. M.: Undulant Fever Due to Brucella of the Porcine Type—Brucella Suis, J. A. M. A. **102**: 1670-1674 (May 19) 1934.

2. Horning, B. G: Outbreak of Undulant Fever Due to Brucella Suis, J. A. M. A. **105**: 1978-1979 (Dec. 14) 1935.

July 1, 1934, an extensive program for the eradication of bovine infectious abortion was initiated by the federal Department of Agriculture. As a necessary part of this a total of 7,400,000 agglutination tests have been performed on cattle in nearly a half million herds. The observations should be closely comparable

TABLE 2.—*Reported Cases of Undulant Fever (1925-1935)**

Year	Number of Cases			Number of States Reporting Cases
	Iowa	New York	United States	
1925	0	3	24	5
1926	1	16	46	8
1927	42	24	217	21
1928	120	65	647	41
1929	204	104	952	44
1930	186	168	1,420	46
1931	200	196	1,351	40
1932	207	209	1,326	41
1933	243	292	1,659	45
1934	279	330	1,887	43
1935	187	234	1,897	45
Total.....	1,669	1,641	11,426	

* Data for Iowa based throughout on cases presenting positive agglutination. For 1925 to 1928 the other data were collected by us through special inquiry of all states; for 1929 to 1933 the figures represent cases officially reported to the U. S. Public Health Service as summarized by Ward Giltner (Brucellosis: A Public Health Problem, Memoir 1, Agric. Exper. Sta., Michigan State College, March 1934), and for 1934 and 1935 the same tabulated from original published reports.

from area to area. The striking feature is the general uniformity in the incidence rather than the differences, as is shown in columns three and four of table 3. Furthermore, the highest percentage of positive reactors was in an area (West South Central) with one of the lowest undulant fever rates. In the West North Central states, with the highest rate of human infection, the incidence of bovine infection was but slightly above the average. Certainly the incidence of Brucella infection in cattle as indicated does not satisfactorily explain the varying rates of attack of undulant fever.

TABLE 3.—*Incidence of Undulant Fever in Various Regions of the United States, with Factors Possibly Accounting for Variations*

Region	Cases of Undulant Fever per 100,000 Population Three-Year Average*	Rural Population, per Cent†	Examination of Cattle		Percentage Distribution of Hogs
			Percentage Positive for Brucella Infection	Percentage in Herds with One or More Reactors	
West North Central..	3.8	58.2	10.7	53.7	53.5
Pacific.....	2.3	32.5	7.9	43.2	2.1
Mountain.....	1.7	60.6	7.6	52.3	2.5
East North Central..	1.6	33.6	9.6	45.1	21.1
Mid-Atlantic.....	1.5	22.3	7.3	52.9	1.7
New England.....	1.5	22.7	10.7	58.5	0.4
South Atlantic.....	1.3	63.9	7.2	49.6	7.1
West South Central..	0.7	63.6	12.2	73.6	6.2
East South Central..	0.6	71.9	10.1	64.9	5.4
Total.....	1.6	43.8	9.5	52.6	100.00

* To adjust somewhat for irregularity in the completeness of reporting, the annual average by states was computed for the three consecutive years from 1929 to 1935 with the greatest number of cases.
† Those living on farms and in towns of less than 2,500 population.

The incidence of contagious abortion in hogs is still somewhat uncertain. It is known that the porcine infection is not as generally distributed as is the bovine. In several European countries, for example, the porcine strain of Brucella has not as yet been encountered in animals or in human beings. In the United States the available evidence indicates that infection in hogs is rather rare save in the midwestern, hog-raising area. In the West North Central states, which have the highest incidence of undulant fever, over half of the country's hogs are produced. Of all states, Iowa has the highest case rate of undulant fever; it also has one fifth of the country's hogs, and these with a known high incidence of Brucella infection. The porcine strain has been encountered but infrequently in animals other than hogs. Therefore the distribution of porcine Brucella infection coincides with, and probably explains, the disproportionately high incidence of undulant fever in the West North Central states and in Iowa.

The admittedly incomplete evidence derived from animal and human studies seems then to indicate that in the New England, Middle Atlantic, East North Central, South Atlantic and Mountain states the rather uniformly distributed bovine infection is largely responsible for undulant fever. The known case rates in these areas are quite similar. In the West North Central states approximately as many infections are derived from hogs, thus giving a total rate twice that of the aforementioned areas. The low rates of the South Central states may be dependent on less adequate recognition and reporting or on rather widely differing socio-economic and racial factors. The slightly higher than average rate in the Pacific states evidently reflects

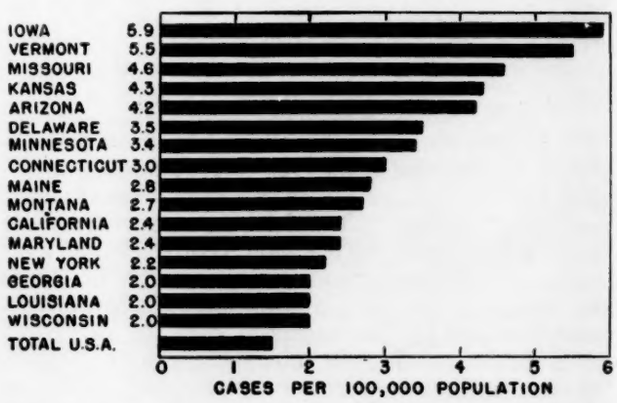

Chart 1.—Undulant fever in states with the highest incidence: three year average, calculated as for table 3.

the keen interest in this disease on the part of workers in California, and also the known occurrence of the caprine infection in certain parts of this state.

GENERAL EPIDEMIOLOGIC OBSERVATIONS

The distribution of cases by age and sex as shown in chart 2 again indicates that in Iowa undulant fever involves active adult males most heavily. In this study, as in that previously reported, slightly more than 75 per cent of our patients were males. The occupational distribution as far as is known is indicated in table 4. The wide variation in the attack rates in different groups is further shown in table 5. The comparatively high rates for men on the farm and the excessive rates for packing house workers strongly emphasize the risks in occupations involving direct contact with livestock and fresh meats. The similarity in rates among women on farms and among other adults not having occupational contact with livestock is added evidence that farm women acquire infection chiefly through the use of raw dairy products.

That there is a definite, though not marked, variation in seasonal incidence is indicated in table 6. This finding agrees with the early observations of undulant fever on the island of Malta. It is known that there is an increase in the excretion of organisms from animals following the birth of young. It is suggested that this

seasonal variation is accounted for, at least in part, by the heavier exposures during and following the farrowing and calving seasons.

Evidence as to sources of infection in individual cases has in this later study rested chiefly on history rather than on examination of animals. Although data are

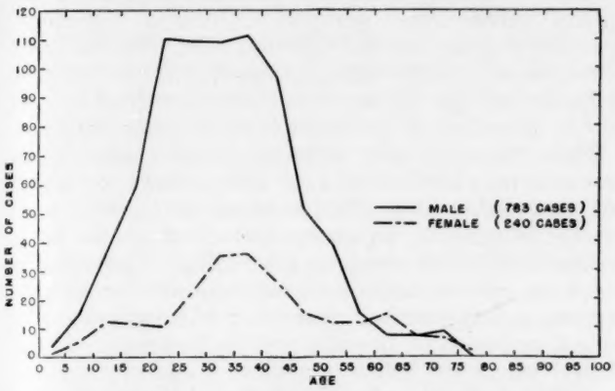

Chart 2.—Undulant fever in Iowa by age and sex, 1927-1935.

not satisfactory for statistical analysis, the records amply confirm the conclusion that in Iowa undulant fever is acquired from hogs about as frequently as from cattle. Support is also given to our contention that inoculation through the skin not infrequently follows direct contact with the discharges of living animals, including the products of abortion, and especially with the tissues of those recently slaughtered.

CLINICAL FEATURES

The earlier clinical observations of undulant fever in Iowa have been described by Woodward,[3] Bierring [4] and ourselves.[5] The data on this later series of cases

TABLE 4.—*Undulant Fever in Iowa by Occupation*

Occupation	Reported Cases					
	1927–1929		1930–1935		Total	
	Number	Per Cent	Number	Per Cent	Number	Per Cent
Farmers, including sons and farm laborers	162	44.8	260	41.3	422	42.6
Women on farms	24	6.6	56	8.9	80	8.1
Packing house employees	37	10.2	66	10.5	103	10.4
Stock buyers	5	1.4	3	0.5	8	0.8
Butchers	2	0.6	11	1.7	13	1.3
Housewives (other than farmers' wives)	37	10.2	64	10.2	101	10.2
Students	18	5.0	35	5.6	53	5.3
Children	19	5.2	16	2.5	35	3.5
Professional, business persons and laborers	58	16.0	118	18.8	176	17.8
Total	362	100.0	629	100.0	991	100.0

and the reported analyses from other states and countries have established the usual clinical characteristics of this disease. Though varying widely in severity and manifestations, there are usually identifying clinical features. The typical onset is gradual but may be abrupt or very insidious. The most constant features of the illness are weakness and elevation of temperature; the most distinctive is profuse sweating. General aching and headache are frequent; pain, moderate or severe, may be localized in the back, neck, joints or abdomen. Sensations of chilliness are common and true rigors not infrequent. Less prominent complaints include anorexia, constipation, urinary frequency, irritability, insomnia and cough. On observation the patients often have an appearance of well being quite inconsistent with the height of the afternoon temperature. Positive physical manifestations other than a palpable spleen in about one third of the cases are also strikingly lacking. The temperature is usually intermittent; typical undulations are rarely observed but wavelike fluctuations in daily maximums may be noted. Few patients are strictly bedfast; some are ambulatory throughout, but most are "up and down." A normal or low white blood count with a relative increase in

TABLE 5.—*Relative Incidence of Undulant Fever in Iowa by Occupational Groups*

Occupation	Population, 1930 Census	Reported Undulant Fever, 1927–1935	Average Annual Cases of Undulant Fever with Known Occupation	Average Annual Cases per 100,000 Population
Packing house employees	8,000	103	11.4	142.5
Men on farms*	324,000	422	46.9	14.5
Women on farms	250,000	80	8.9	3.6
Others 10 years and above	1,375,000	371	41.2	3.0
Children under 10 years	464,000	15	1.7	0.4
Total	2,471,000	991	110.1	4.5

* Includes farm laborers, estimated number 74,000.

mononuclears is usually found. The diagnosis is ordinarily confirmed by the specific agglutination test, but in a small percentage of cases this test remains negative. Spontaneous and complete recovery in from one to three months is the rule, but one or more relapses are not infrequent. Stubbornly chronic disease occasionally ensues. From 2 to 3 per cent of all cases terminate fatally, usually with manifest complications.

The clinical character and course of generalized Brucella infection are now rather widely known. Recent studies of this disease have emphasized the occurrence of localized Brucella infections, commonly suppurative in character. Their study represents the major recent addition to the clinical knowledge of

TABLE 6.—*The Seasonal Incidence of Undulant Fever*

Month	Cases Reported to Public Health Service by Month of Report, 1929–1935		Iowa Cases by Month of Onset, 1928–1935		Iowa Cases by Month of First Positive Agglutination Test, 1930–1933	
	Number	Per Cent	Number	Per Cent	Number	Per Cent
January	589	5.6	64	6.0	57	6.8
February	625	6.0	74	6.9	44	5.3
March	676	6.4	115	10.8	50	6.0
April	769	7.3	91	8.5	62	7.4
May	932	8.9	109	10.2	82	9.8
June	1,122	10.7	102	9.6	88	10.5
July	1,087	10.4	110	10.3	102	12.2
August	1,052	10.0	117	11.0	88	10.5
September	1,036	9.9	78	7.3	59	7.1
October	934	8.9	59	5.5	58	6.9
November	842	8.0	85	8.0	82	9.8
December	828	7.9	63	5.9	64	7.7
Total	10,492	100.0	1,067	100.0	836	100.0

undulant fever. Attention is therefore directed to manifestations which have hitherto offered such difficult diagnostic problems.

LOCALIZED BRUCELLA INFECTION

Localization has long been recognized as characteristic of Brucella infection of animals. In guinea-pigs, especially those inoculated with the porcine strain, we have repeatedly observed suppurative lesions, notably arthritis, osteomyelitis, spondylitis, meningitis, orchitis

3. Woodward, L. R.: J. Iowa State M. Soc. **17**: 312-317 (Sept.) 1927.
4. Bierring, W. L.: Undulant Fever, J. A. M. A. **93**: 897-901 (Sept. 21) 1929.
5. Hardy, A. V.; Jordan, C. F.; Borts, I. H., and Hardy, Grace C.: Bull. 158, National Institute of Health, 1931.

and abscesses of the spleen, liver, lymph nodes and other soft tissues. In cattle brucellosis is typically a localized infection, involving the udder, the pregnant uterus and occasionally the joints. In hogs, according to the observations of Thomsen [6] in Denmark, and Feldman and Olson [7] in this country, focal lesions are not unusual. The pregnant uterus may be affected. Suppurative or nonsuppurative epididymitis is relatively frequent. Occasionally the testes or seminal vesicles are involved. Destructive bone and joint lesions, meningitis, soft tissue abscesses and tenosynovitis are also encountered. In horses, according to Fitch,[8] certain rather common suppurative lesions (poll evil and fistulous withers) may be due to Brucella.

With such local lesions in animals, the recognition of similar conditions in human beings has not been unexpected. From inflammatory lesions in various sites Brucella has been isolated. In many instances the finding of no other organism than this tends to support its etiologic rôle; in others the causal relationship is still uncertain. In order that bacteriologic procedures effective for the isolation of Brucella may be employed more generally in the study of certain medical and surgical conditions, we shall enumerate the more common local lesions attributed to Brucella infection. Except as indicated, the conditions listed have been observed in Iowa. These localized lesions are as follows:

Skeletal System.—Spondylitis: As observed and reported, this has simulated Pott's disease.

Arthritis: This has included relatively acute as well as chronic septic processes; also nonsuppurative lesions.

Osteomyelitis: Various long bones and, in one instance the small bones of the wrist have been involved.

Nervous System.—Meningitis and Meningio-Encephalitis: One case closely simulated brain tumor.

Digestive System.—Cholecystitis: Amoss,[9] likewise Gilbert and Coleman,[10] has isolated Brucella from bile aspirated by the duodenal tube or obtained at operation. The organisms have also been obtained in cultures from subacutely and chronically inflamed gallbladders.

Respiratory Organs.—Pleurisy with Effusion: In one case Brucella was isolated from the pleural fluid by guinea-pig inoculation.

Cardiovascular System.—Endocarditis: This has been a not infrequent observation in undulant fever with complications.

Pericarditis: This occurred in association with endocarditis in one case.

Mycotic Aneurysm: Involvement of the basilar artery was discovered in two cases at autopsy.

Lymphatic System.—Adenitis: One case of suppurative cervical adenitis suggesting a tuberculous condition yielded a pure culture of Brucella.

Urogenital System.—Urinary Tract Involvement: Cases with initial symptoms of cystitis and renal tuberculosis have been diagnosed as undulant fever through isolation of the organism from the urine and positive agglutination test.

Endometritis: The bacteriologic study of aborted fetuses and postabortion uterine discharges has indicated occasional involvement of the pregnant uterus.[11]

Glandular System.—Mastitis: The not infrequent occurrence of this complication in undulant fever gives reason for assuming that the specific infection localizes in breast tissue.

Cutaneous and Subcutaneous Tissues.—In several reported cases, chronic subcutaneous abscesses have yielded pure culture of Brucella.

In addition to the foregoing, the organisms under consideration have been isolated by different workers also from such places as a pancreatic abscess, an infected dermoid, peritoneal lesions suggestive of miliary tuberculosis, removed tonsils, a pathologic appendix and an infected fallopian tube. On the basis of conditions found in animals and clinical observations in human beings, the occurrence of other focal lesions may be suspected, as for example in the lungs or spleen.

There has been wide variation in the clinical types of cases in which these local lesions have occurred, but they have been discovered most frequently in chronic infections. In course and character the focal process itself often simulates tuberculosis. Occasionally the local manifestation so overshadows the general symptoms that undulant fever is not suspected. The wide distribution of Brucella and the frequency of subclinical infections indicates a more frequent examination for these organisms. Bacteriologic studies of inflammatory processes must be regarded as incomplete if adequate search for Brucella is not included.

The prevalence of these localized infections has not yet been determined. Limited observations with a substantial number of positive observations demand that they be more commonly considered in differential diagnosis. Thus far they have been observed more frequently in Iowa than elsewhere, owing, according to present bacteriologic evidence, to their greater frequency in infections with the porcine than with the bovine strains of Brucella.

DIAGNOSIS AND THERAPY

With the more general appreciation that the agglutination test remains negative in some cases, other diagnostic aids are receiving more attention. The skin test and the opsonocytophagic reaction (Huddleson) are being more widely used and accurately interpreted. We feel that the importance of cultural studies must be persistently emphasized. More general adoption of bacteriologic procedures required for the isolation of Brucella would increase materially the clinical and epidemiologic knowledge of this disease.

The difficulties in diagnosis of the mild and more chronic forms have repeatedly come to our attention. Evans [12] has recently presented strong evidence that calls for consideration of brucellosis before a too ready acceptance of such diagnoses as neurasthenia or psychoneurosis. The frequence of occurrence of such atypical infections is now being intensively studied in selected localities by the United States Public Health Service.

The difficulty in evaluating any therapeutic procedure in a variable self-limiting disease caused by three different strains of organism is apparent. In our studies we have sought to appraise the specific value of vaccines and brucellin. Large quantities of these preparations have been distributed, but the number and nature of the reports concerning their value permit no definite conclusions. Thus far we can only say that most of the physicians who supplied information spoke approvingly of the response to brucellin therapy. We have not been able to obtain, however, an adequate and controlled series of therapeutic tests. In our opinion the most important therapeutic considerations are early diagnosis, continuous bed rest and general supportive measures.

6. Thomsen, Alex: Brucella Infection in Swine, Acta path. et microbiol. Scandinav., supplementum XXI, 1935.

7. Feldman, W. H., and Olson, Carl, Jr.: Spondylitis of Swine Associated with Bacteria of the Brucella Group, Arch. Path. **16**: 195-210 (Aug.) 1933.

8. Fitch, C. P.; Deley, A. L., and Boyd, W. L.: J. Am. Vet. M. A. **76**: 17-24 (Jan.) 1930.

9. Amoss, H. L.: Internat. Clin. **4**: 93-98 (Dec.) 1931.

10. Gilbert, Ruth, and Coleman, Marion B.: J. Infect. Dis. **54**: 305-312 (May-June) 1934.

11. Carpenter, C. M., and Boak, Ruth: Isolation of Brucella Abortus from the Human Fetus, J. A. M. A. **96**: 1212-1216 (April 11) 1931. Kristensen, M.: Ann. de méd. **26**: 339-350 (Nov.) 1929. Harris, H. J.: New York State J. Med. **34**: 1017-1021 (Dec. 1) 1934.

12. Evans, Alice C.: Chronic Brucellosis, J. A. M. A. **103**: 665-667 (Sept. 1) 1934.

COMMENT

Epidemiologically, undulant fever is not one disease but a group of three closely related diseases. These are caused by three varieties of Brucella which differ as to animal host, mode of dissemination, pathogenicity and probably infectivity for man. Geographically in this country the bovine variety of Brucella is widely and rather uniformly distributed, while the porcine and caprine varieties are largely confined to specific localities. On these bases the epidemiologic variations in undulant fever are explainable.

Clinically Brucella infection of man presents also a combined picture, that of a generalized infection and of a variety of localized inflammatory lesions. The latter may occur as complications or sequelae of the generalized infection or may appear to be independent processes. The sites of localization are known to be numerous, but the frequency of their occurrence must yet be determined.

CONCLUSIONS

1. During the period 1930 to 1935 inclusive, data were collected on 705 additional cases of undulant fever, giving a total series of 1,080 Iowa cases. This number, according to laboratory observations, represents about two thirds of all cases diagnosed in this state.

2. The porcine variety of Brucella was found in a total of eighty-seven, or 70 per cent, of the 124 cases from which the organism was isolated from the blood stream or local lesions.

3. Iowa and the surrounding states have a demonstrably higher incidence of undulant fever than do other areas. Limited evidence indicates that the porcine type of infection is largely limited to these states and accounts for the unusual incidence.

4. The significance of direct contact with livestock and carcasses has been further demonstrated.

5. Recent clinical studies have called attention to a wide variety of localized Brucella infections.

6. Blood cultures, skin tests and the opsonocytophagic reaction are of epidemiologic and clinical importance.

7. Conclusive evidence as to the value of specific therapy has not been obtained.

College of Physicians and Surgeons, New York—Iowa State Department of Health and State Hygienic Laboratories.

ABSTRACT OF DISCUSSION

DR. FRED E. ANGLE, Kansas City, Kan.: We have just heard a report of the most complete epidemiologic surgery of undulant fever thus far reported in the United States. Dr. Hardy and his co-workers have made a major contribution to medical progress in this study. Their description of the varied symptomatology and the numerous complications immediately places this disease in the category of tuberculosis, syphilis and malignant diseases, in that Brucella is capable of attacking any organ. The figures presented would suggest that clinical undulant fever is a comparatively rare condition. This is only partially true, because the figures do not include a large number of patients who belong in the subclinical and ambulatory groups. From my experience, I am convinced that these are the larger groups. In 2,000 Wassermann serums studied for Brucella agglutinins, 2.6 per cent yielded positive results. Other observers have recorded even higher percentages. Then again, about 6 per cent of acutely ill patients have no agglutinins in the blood but possess either positive Brucella cultures, skin tests or cytophagic reactions. May I ask the authors their experience concerning this group? Clinicians are much concerned with the management of these patients. The interpretation of the end results of treatment of patients with brucelliasis is most difficult. My experience, and the experience of many observers both in this country and in Europe, has been most favorable with vaccine therapy. I am convinced that it is the best single therapeutic agent now available. At the Atlantic City session I outlined the treatment of 100 cases observed over a period of seven years. In those patients who do not respond to treatment, a careful search may reveal a complicating chronic focal infection. I have had a number of patients who, after the removal of these foci, have promptly recovered. Brucella is apparently very toxic to the nervous system. Hence there remains in many patients a residual manifestation usually in the form of neurasthenia or psychoneurosis. I have encountered considerable difficulty in handling this particular phase. No discussion on undulant fever would be complete which did not mention the fact that pasteurization or sterilization of milk and milk products eradicates this source of the disease.

DR. WALTER L. BIERRING, Des Moines, Iowa: This comprehensive study not only represents pioneer investigation of undulant fever but illustrates the value of the correlation of the public health worker and the clinician in furnishing interesting and significant clinical facts. Ten years ago this was regarded a comparatively rare disease and now we have a report of more than 1,000 cases occurring in one state alone. At least three distinct sources of infection exist. Its origin in different animal species, often producing different symptoms, with varying localization, produces a rather unusual clinical picture. Its infection by contact through the unbroken skin is well established and is a contribution by one of the authors. The fact that the porcine type of infection predominates in the series reported is rather significant, although Iowa furnishes one fifth of the hogs of the country, and in this middle section one third of the hogs for the entire country are produced. It is the localization of the inflammations and infections that distinctly complicate the clinical picture. The characteristic clinical syndrome is a weakness, a continuous fever which has an undulating course, and a primary sweating period. I believe there is no other form of perspiration that resembles this particular clinical phenomenon. The water just rolls off the patient, the night clothing and bedding requiring changing many times during the night. That it occurs nocturnally is also characteristic. In many respects it resembles the sweating incident to the malarial paroxysm, but it is really more striking. The localization of the disease in the different tissues has brought it prominently under clinical observation. A confusing diagnostic feature is the apparent sense of well being on the part of the patient. The illness can continue for months without the patient appearing very sick. The fact that we are having more milk-borne epidemics is significant, and as these are frequently due to the porcine strain of the Brucella organism it becomes difficult to determine to what extent the dairy industry is involved. This offers a further illustration of the danger of contact with diseased tissues, and thus undulant fever is coming to be regarded as an industrial hazard. A specific treatment has not yet been generally accepted, although some virtue is accorded to vaccine therapy. It is interesting to contemplate that practically a new disease has come under observation in this section during the past ten years which taxes our diagnostic ability and thus far has not been very responsive to therapeutic endeavors.

DR. WILLIAM J. KERR, San Francisco: In California we have all three strains of Brucella organisms. The porcine strain is found among the hogs from the Middle West brought there for slaughter and consumption. The melitensis strain is brought to us from the Southwestern part of the country and Mexico, seen chiefly in the herds of goats and infecting man through the great consumption of goat's milk in that part of the country. We also have the bovine strain in the cattle. The porcine strain is limited more or less to the workers in slaughterhouses, and the melitensis strain is limited to some extent to the laboratory workers in the institutions where bacteriologic studies are going on.

DR. A. V. HARDY, New York: Dr. Angle asked concerning our experience with the less typical cases not diagnosed by a positive agglutination test. In our study we have given our attention chiefly to those cases in which we were satisfied that there was no question as to the diagnosis of undulant fever and hence we have had but little experience with cases which failed to yield a positive agglutination test. Such as we have had

warrant our emphasizing the diagnostic value of the phagocytic test as described by Huddleson and the skin test. Dr. Angle has also wisely called attention to prevention. The one feature which disurbs us, particularly in Iowa, is that attention is being given at present to the source of infection which gives a less severe type of disease. We feel that before this problem is solved there must be a program of eradication of Brucella infection of hogs, such as is now taking place for the eradication of the bovine infection.

THE BLOOD CHANGES IN NORMAL PREGNANCY

AND THEIR RELATION TO THE IRON AND PROTEIN SUPPLIED BY THE DIET

FRANK H. BETHELL, M.D.
ANN ARBOR, MICH.

Within recent years much has been learned of the physiology of the blood-making organs from the study of the circulating red blood cells. By determinations

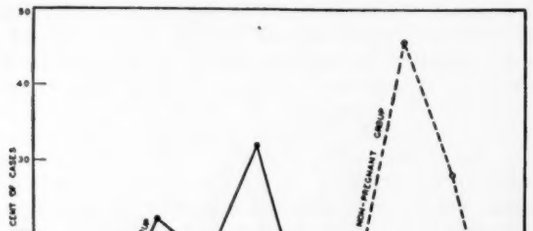

Chart 1.—A comparison of the frequency distribution of the hemoglobin values obtained on sixty-six pregnant women in the last trimester of gestation and on fifty nonpregnant women of the same age range, from 18 to 22 years.

of the number of erythrocytes and their size, form and relative content of hemoglobin in the presence of anemia it is often possible to recognize a specific defect in their development and in some instances to supply the deficient factor. Those anemias characterized by small red blood cells and a low color index are generally attributed to a lack of iron, whereas large erythrocytes, carrying more than the usual complement of hemoglobin, are considered to denote anemia of the pernicious group dependent on interference with the maturation of the erythrocytes and due to the lack of a substance found in liver.[1] Although deficiencies other than iron and the factors which make up the liver principle have been suggested as possible causes of impaired blood formation, with the exception of vitamin C[2] no other dietary lack has been definitely shown to cause anemia in adult human beings.

It is intended in this communication to report the results of blood studies on a group of young women with uncomplicated pregnancies and to discuss some aspects of the relation of diet to the blood in pregnancy. Sixty-six subjects, of whom fifty-four were primiparas, were examined at intervals throughout the last thirteen weeks of gestation. The subjects were unselected except that those with concomitant disease were excluded. During this period they were maintained within an institution and their health and diet were under constant supervision. Among the members of such a group one would not expect to find instances of grave anemia and no such cases were encountered. However, it was thought that analysis of the alterations in the blood commonly found in healthy pregnant women might throw additional light on the etiology of the anemias of pregnancy and provide a basis both for their prevention and for their effective therapy. Erythrocyte counts were made with instruments certified by the U. S. Bureau of Standards. Hemoglobin estimations were carried out by a modified Sahli technic in which 100 per cent is equivalent to 15.8 Gm. of hemoglobin per hundred cubic centimeters of blood as determined by the oxygen capacity method. For the hematocrit determinations the Wintrobe tube was used. As an anticoagulant a mixture of 6 parts of ammonium oxalate and 4 parts of potassium oxalate was employed. Two milligrams of the combined dry salts was allowed for each cubic centimeter of blood. In this solution the volume of the erythrocytes is unaltered.[3]

In such a study, in which deviations from the normal may be slight, the value of a control group is apparent. For this purpose blood examinations were made on fifty nonpregnant young women. The group was made up of student nurses, from 18 to 22 years of age, without evidence of dietary deficiency. It was found that in an appreciable number there occurred a definite decrease in average erythrocyte volume. In some instances in which there existed such a tendency to microcytosis, a history was obtained of excessive menstrual bleeding, and in the others also unrecognized menorrhagia may well have been the cause.[4] If those nonpregnant subjects with an average erythrocyte volume of less than 85 cubic microns, comprising fourteen

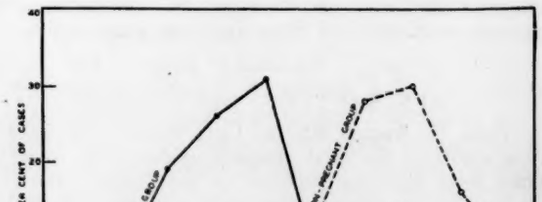

Chart 2.—A comparison of the erythrocyte counts obtained from the same subjects as provided in the data shown on chart 1.

members, 28 per cent of the total are excluded, the values for the control group are: red blood cells, range 4,050,000 to 5,280,000, average 4,660,000; hemoglobin, range 78 per cent (12.4 Gm.) to 97 per cent (15.4 Gm.), average 87.5 per cent (13.8 Gm.); mean corpuscular

From the Thomas Henry Simpson Memorial Institute for Medical Research, University of Michigan.

Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Eighty-Seventh Annual Session of the American Medical Association, Kansas City, Mo., May 13, 1936.

Jean Kyer and Ellen Schock Rottschaefer gave technical assistance. Appreciation is expressed especially of the cooperation of Dr. Richard H. Freyberg of the Department of Clinical Investigation and Drs. Clair E. Folsome and Richard D. Reekie of the Department of Obstetrics and Gynecology.

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4. Barer, A. P.; Fowler, W. M., and Baldridge, C. W.: Blood Loss During Normal Menstruation, Proc. Soc. Exper. Biol. & Med. **32**: 1458 (June) 1935.

volume, range 85 cubic microns to 96 cubic microns, average 89.1 cubic microns; color index,[5] range 0.85 to 1.04, average 0.94.

Of the pregnant group, sixty, or 90 per cent, showed blood values below the minimum figures for the red blood cell count and hemoglobin as given. The increase in plasma volume known to occur during the latter half of pregnancy accounts in part for the reduction of erythrocytes and hemoglobin. Blood and plasma volume determinations on fifteen of these subjects confirm the conclusions of Dieckmann and Wegner [6] that, in the last trimester of pregnancy, an increase in blood volume with relative reduction of red blood cells ordinarily is present and that the volume of the plasma is augmented by about 25 per cent. With the hematocrit values as a basis for calculation, and on the assumption that there occurs no compensatory output of red blood cells, the lowest erythrocyte count that may be explained solely by hydremia is approximately 3,700,000 per cubic millimeter; the minimum hemoglobin is about 70 per cent (11.3 Gm.). Values lower than these were found in 70 per cent of the subjects. In table 1 are given the hematologic data obtained from the nonpregnant group and in table 2 are shown the observations in the series of pregnant women. On charts 1, 2 and 3 are plotted the comparative frequency of the hemoglobin values, erythrocyte counts and average erythrocyte volumes of the pregnant and nonpregnant groups. Those cases of

TABLE 1.—*Blood Values Obtained on Fifty Healthy Nonpregnant Young Women*

Cases	Erythrocyte Count, Millions per Cu. Mm.	Hemoglobin, per Cent (100%= 15.8 Gm.)	Hematocrit	Average Erythrocyte Volume. Cubic Microns	Color Index (Uncorrected)
Average Erythrocyte Volume (M. C. V.) Greater Than 85 Cubic Microns					
1	4.56	79	39.0	86	0.87
2	4.85	85	44.5	92	0.88
3	5.28	93	45.0	87	0.88
4	4.62	87	41.5	90	0.86
5	4.44	83	43.0	97	0.93
6	4.65	88	42.0	90	0.95
7	5.05	87	43.5	86	0.86
8	4.48	85	40.5	90	0.95
9	4.59	85	40.5	88	0.92
10	4.35	78	37.0	85	0.90
11	4.64	78	40.5	87	0.85
12	5.01	87	42.5	85	0.87
13	4.82	93	44.0	91	0.97
14	4.31	85	38.0	88	0.99
15	4.21	81	40.0	95	0.96
16	4.14	85	39.5	95	1.04
17	4.84	97	44.5	91	1.01
18	4.70	92	42.0	89	0.98
19	4.37	87	40.5	93	1.00
20	4.53	89	40.5	89	0.98
21	4.80	91	41.5	86	0.95
22	4.05	82	39.0	96	1.01
23	4.80	92	42.0	87	0.96
24	4.22	82	38.0	90	0.98
25	4.56	87	40.0	88	0.96
26	4.56	86	39.0	85	0.95
27	5.17	97	47.0	91	0.94
28	4.77	86	41.0	86	0.90
29	4.84	88	42.0	87	0.91
30	4.89	94	43.5	90	0.96
31	4.59	91	43.5	95	1.00
32	4.72	88	41.0	87	0.94
33	4.96	93	45.5	92	0.93
34	4.95	86	45.5	92	0.87
35	4.87	93	41.5	85	0.93
36	4.79	91	42.0	88	0.95
Average	4.66	87.5	41.7	89.1	0.941
Average Erythrocyte Volume Less Than 85 Cubic Microns					
*37	5.08	78	39.0	77	0.77
*38	4.55	76	38.0	84	0.82
*39	5.51	88	40.5	74	0.79
40	4.96	90	39.5	80	0.90
*41	5.05	90	38.5	76	0.90
42	4.67	86	38.0	81	0.92
*43	5.57	93	42.0	75	0.85
*44	5.07	88	41.5	82	0.87
45	4.86	86	41.0	84	0.89
46	4.83	84	39.0	81	0.87
*47	4.91	87	40.5	82	0.89
48	5.11	84	41.5	81	0.82
49	4.62	88	41.0	84	0.96
*50	5.09	94	39.5	78	0.92
Average	4.99	86.6	39.9	79.2	0.869
Average of both groups	4.75	87.2	41.2	86.3	0.921
*** Subjects Reexamined After Two Months**					
37	4.63	75	39.0	84	0.81
38	4.42	74	36.5	83	0.84
39	4.84	88	42.5	88	0.91
41	4.77	88	42.5	89	0.92
43	4.13	65	33.5	81	0.78
44	4.09	78	41.0	87	0.83
47	4.30	67	35.0	81	0.78
50	5.37	88	45.5	85	0.82

TABLE 2.—*Blood Values Obtained on Sixty-Six Healthy Pregnant Women*

Cases	Erythrocyte Count, Millions per Cu. Mm.	Hemoglobin, per Cent (100%= 15.8 Gm.)	Hematocrit	Average Erythrocyte Volume. Cubic Microns	Color Index (Uncorrected)
Normal Blood Values; Reduction Accounted for by Plasma Dilution					
1	4.25	75	37.0	87	0.88
2	3.94	74	39.0	101	0.95
3	3.95	71	38.0	96	0.90
4	4.01	71	40.0	100	0.90
5	4.19	74	37.5	90	0.88
6	3.75	70	34.0	91	0.93
7	3.87	76	36.0	93	0.99
8	4.47	83	42.5	95	0.93
9	3.98	72	37.5	94	0.90
10	4.28	73	39.0	91	0.85
11	5.05	85	44.5	88	0.84
12	3.78	71	37.0	98	0.91
13	4.14	73	36.5	88	0.89
14	4.14	70	40.0	97	0.85
15	4.14	72	37.0	90	0.88
16	4.20	70	37.0	88	0.83
17	3.91	70	34.0	86	0.90
18	4.09	70	36.5	89	0.85
19	4.23	70	38.0	90	0.83
20	4.58	82	40.0	87	0.90
21	3.79	70	34.0	90	0.92
22	3.89	75	36.0	92	0.96
23	4.02	82	38.5	96	1.00
24	4.19	70	38.5	92	0.83
25	4.09	72	38.0	93	0.88
26	4.17	71	36.5	88	0.86
27	4.15	81	40.0	96	0.98
28	4.05	79	38.0	94	0.97
Average	4.12	75	38.0	92	0.896
Iron Deficiency Anemia; Reactive Bone Marrow					
29	4.31	65	36.5	85	0.75
30	4.12	60	34.0	83	0.73
31	3.94	61	32.5	84	0.78
32	4.22	64	33.5	79	0.76
33	4.30	67	34.0	80	0.78
34	4.13	64	31.5	76	0.77
35	4.75	66	38.5	81	0.68
36	5.00	64	38.5	77	0.64
37	3.86	47	29.0	75	0.61
38	4.24	62	35.0	82	0.75
39	3.77	59	31.0	82	0.77
40	3.97	60	33.0	83	0.75
41	4.00	61	34.0	85	0.76
42	4.19	66	35.0	83	0.78
43	3.97	60	30.5	74	0.75
44	4.10	65	34.0	83	0.80
45	3.97	64	33.5	85	0.80
46	4.55	66	36.0	79	0.72
47	3.83	61	32.5	85	0.79
48	3.93	60	32.5	83	0.76
Average	4.16	62	33.7	81	0.747
Protein Deficiency Anemia; Inactive Bone Marrow					
49	3.49	58	33.5	96	0.83
50	3.64	69	37.5	103	0.95
51	3.63	65	35.5	98	0.90
52	3.54	70	37.0	105	0.99
53	3.22	57	34.0	106	0.90
54	3.37	61	33.0	98	0.91
55	3.59	64	35.0	97	0.84
56	3.39	57	32.0	94	0.84
57	3.54	69	37.5	106	0.97
58	3.52	58	33.0	94	0.83
59	3.50	70	36.0	103	1.00
60	3.66	65	37.0	99	0.90
61	3.69	67	36.5	99	0.90
62	3.61	75	36.0	100	1.04
63	3.68	76	34.0	92	1.01
64	3.41	66	33.0	97	0.97
65	3.66	70	38.5	105	0.96
66	3.57	64	35.5	100	0.90
Average	3.54	65	35.2	100	0.924

5. Uncorrected. Corrected color index values may be obtained on data presented in this paper by multiplying by the factor 1.1.

6. Dieckmann, W. J., and Wegner, C. R.: The Blood in Normal Pregnancy: Blood and Plasma Volumes, Arch. Int. Med. **53**: 71 (Jan.) 1934.

pregnancy in which definite anemia existed fell into two distinct groups, approximately equal in number. One, characterized by lowered color index, small red blood cells and an increased percentage of reticulocytes, is readily accounted for by a lack of iron. In the presence of such anemia the bone marrow is reactive, its content of normoblasts is greater than that of the nonanemic person,[7] and through enhancing the availability of iron these nucleated cells will rapidly mature into functional

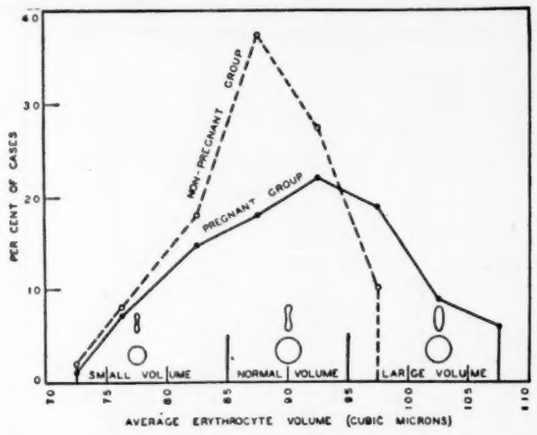

Chart 3.—A comparison of the average erythrocyte volumes obtained from the same subjects as provided in the data shown on charts 1 and 2.

erythrocytes. The second group is differentiated by an approximately equivalent reduction of red blood cells and hemoglobin, resulting in a color index nearer unity, by high normal or increased volume of the erythrocytes, and by a reticulocyte percentage below the average normal range. This blood picture is in many respects similar in its distinguishing features to hypoplastic anemia in nonpregnant persons, in whom bone marrow studies reveal an inactive marrow with little evidence of regeneration. Chart 4 illustrates the differentiation of the blood observations in pregnancy into three groups; the first, in which the values are within normal limits or are explainable solely on the basis of increased plasma volume; the second, characterized by anemia with low color index and small red blood cells; and the third, in which anemia with normal color index and red blood cells of high normal or definitely increased volume is found.

In the subsequent discussion of these types of blood change in pregnancy, data will be presented which, it is felt, will place in question a recent contention that the anemias of pregnancy, excepting those due to concomitant disease or loss of blood, are limited to a hypochromic type dependent on lack of iron and a "pernicious" form resulting from interference with the assimilation or utilization of the factors composing the "liver principle."[8]

The view that a diet poor in iron and a relative reduction of the capacity of the stomach to secrete hydrochloric acid may together or independently lead, during pregnancy, to iron deficiency anemia is based on the fact that the infant is dependent on the mother for the materials required for growth and blood formation before birth as well for a large part of its iron requirement during the first months of extra-uterine life. It is, however, fallacious to assume that such iron is necessarily obtained from the maternal diet at the time it is stored by the fetus.[9] The total iron content of the new-born child approximates 350 to 450 mg.,[9] or no more than the quantity contained in 1 liter of blood. Considering that the pregnant woman saves, from the absence of menstruation over ten periods, from one third to one half of this amount of blood, the net iron loss is no more than would be removed through serving as donor for a single moderate sized blood transfusion. The reserves of blood and of blood-

TABLE 3.—*Lack of Correlation Between the Gastric Secretion of Free Acid and the Blood Values in Pregnancy*

Cases	Free Acid Concentration, per Cent N/10 Acid in Gastric Contents	Red Blood Cells, Millions	Hemoglobin, per Cent	Hematocrit	Mean Corpuscular Volume, Cubic Microns	Color Index
1	0	4.50	88	42.0	93	0.98
2	38	4.12	60	34.0	83	0.73
3	2	3.75	70	34.0	91	0.93
4	6	4.19	74	37.5	90	0.86
5	26	3.87	76	36.0	93	0.99
6	16	4.22	64	33.5	79	0.76
7	18	3.98	72	37.5	94	0.90
8	30	3.79	61	33.0	86	0.80
9	14	3.93	60	32.5	83	0.78
10	22	5.05	85	44.5	88	0.84
11	28	4.13	64	31.5	76	0.77
12	4	4.01	77	40.5	100	0.91
13	12	3.84	61	33.0	86	0.80
14	20	3.64	69	37.5	103	0.95
15	8	3.94	74	39.0	101	0.94

building materials possessed by the healthy person without a tendency toward anemia are adequate to replace such a loss without demonstrable effect on the blood level.

In order to check the validity of this reasoning, a continuous determination of the iron exchange was carried out in the hospital on a healthy young woman throughout the last sixty-three days of her pregnancy and the first twelve days after delivery.[10] A number of significant iron balance studies on pregnant women have been reported by Coons,[11] but her conclusions, based on short period observations, are open to the objection that, even though the diet is constant, the out-

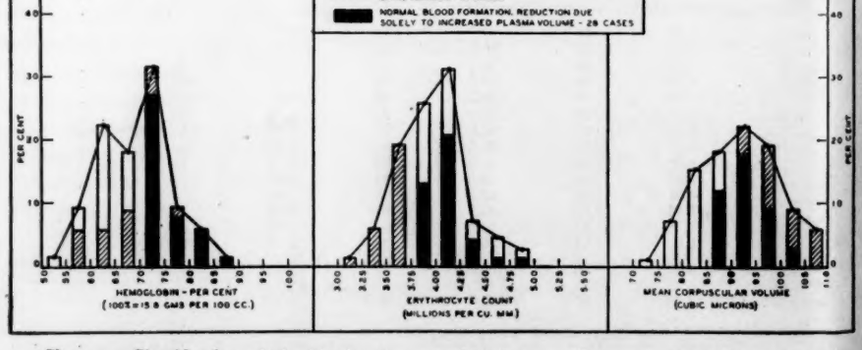
HYPERACTIVE BLOOD FORMATION REGENERATIVE BONE MARROW - 20 CASES
HYPOACTIVE BLOOD FORMATION AREGENERATIVE BONE MARROW - 18 CASES
NORMAL BLOOD FORMATION, REDUCTION DUE SOLELY TO INCREASED PLASMA VOLUME - 28 CASES
PER CENT
HEMOGLOBIN - PER CENT
ERYTHROCYTE COUNT
(MILLIONS PER CU. MM.)
MEAN CORPUSCULAR VOLUME
(CUBIC MICRONS)

Chart 4.—Classification of the blood values of sixty-six pregnant women according to the type of bone marrow reaction to the demands of pregnancy.

7. Dameshek, William: Primary Hypochromic Anemia (Erythronormoblastic Anemia), Am. J. M. Sc. **182**: 520 (Oct.) 1931.

8. Strauss, M. B.: Etiology and Prevention of Anemia in Pregnancy, Ann. Int. Med. **9**: 38 (July) 1935.

9. Coons, Callie May: Studies in Metabolism During Pregnancy, Bull. 223, Agricultural Experiment Station, Oklahoma Agricultural and Mechanical College.

10. Bethell, F. H., and Kyer, Jean: The Requirement of Iron and Copper and the Influence of Diet upon Hemoglobin Formation During Normal Pregnancy, to be published.

11. Coons,[9] Coons, Callie May: Iron Retention by Women During Pregnancy, J. Biol. Chem. **97**: 215 (July) 1932.

put of iron fluctuates widely from week to week. Moreover, since the subjects of her investigations were not proved to have normal blood values in respect to hemoglobin level, erythrocyte count and average erythrocyte size, their dietary requirements for blood formation were not necessarily physiologic.

The subject of the present study received a uniform diet supplying 7.1 mg. of iron daily. Supplementary vitamins A, B, D and C were given, and the total daily

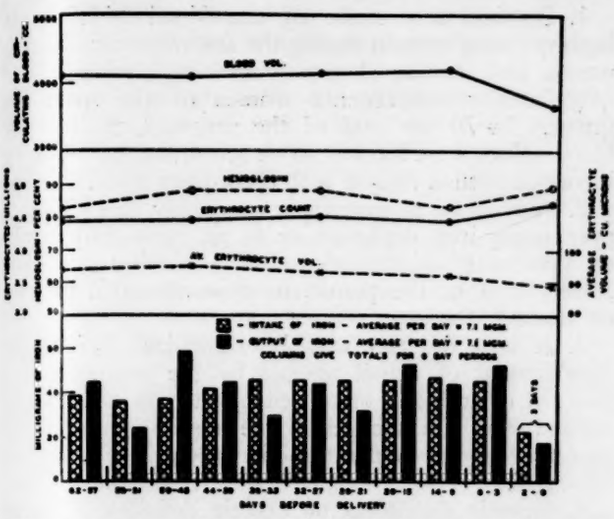

Chart 5.—The iron exchange and the blood values of a healthy woman during the latter months of pregnancy.

protein approximated 80 Gm. supplied chiefly by milk, eggs and canned salmon. The combined urine and stool daily iron output, averaged for the total time of observation, equaled exactly the intake, although marked variations occurred in successive six day periods. The average daily intake and output of copper were respectively 2.20 and 2.15 mg. daily. In spite of a relatively low iron and copper content of the diet and practically no retention of either element during the last months of gestation, the blood values were maintained at levels distinctly above the average in pregnancy (chart 5). The blood of the infant likewise showed high normal values. It is significant that the habitual diet of this subject, before coming under observation, lacked meat and eggs with a consequent low iron and copper content. She was, however, accustomed to drinking a generous quantity of milk. It is also of interest that gastric analysis performed on two occasions revealed absence of free acid after alcohol stimulation, although hydrochloric acid was present in considerable amount after the subcutaneous injection of histamine.

During pregnancy there commonly occurs a reduction in the quantity of hydrochloric acid secreted by the stomach in response to physiologic stimuli.[12] Such relative hypochlorhydria has been considered an important factor in the development of the iron deficiency anemia of pregnant women,[13] since it has been shown that iron is more readily absorbed from an acid than from an alkaline medium.[14] However, the data presented in table 3 demonstrate no relationship between the amount of gastric hydrochloric acid secreted in response to alcohol stimulation and the level of the blood count. Although limited in number, these observations suggest that temporary reduction of the gastric acidity is not a direct cause of lowered blood values in pregnancy.

The explanation of the occurrence of hypochromic anemia in pregnant women is not to be found primarily in the circumstances incident to gestation but should be sought in the status of the hematopoietic mechanism prior to conception. In the series of cases under discussion the percentage of pregnant women developing definite anemia of the iron deficiency type equals almost exactly that of the nonpregnant subjects showing a tendency to such anemia as evidenced by small red blood cells. These results may be presumed to indicate depletion of the iron reserves, whether caused by excessive blood loss, repeated childbirths or defective assimilation of the metal, thus rendering such a woman less able to meet the moderate demands of pregnancy. Consequently, the routine administration of iron during gestation serves less of a prophylactic purpose than as a corrective measure and is effective in those cases in which predisposition to hypochromic anemia already exists. Although no disadvantage is known to attend the indiscriminate use of iron in pregnancy, many instances are encountered in which its administration fails either to correct or to prevent anemia. Illustrations of such failure of response to iron therapy are provided in chart 6. Such anemia is not of the iron deficiency type and it may be differentiated from it by simple diagnostic procedures. It would seem to be distinctly advisable to give effective doses of an inorganic

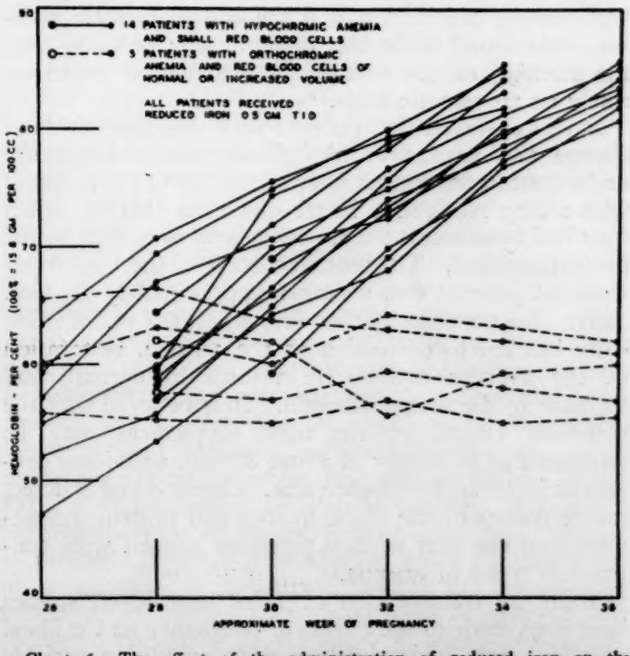
14 PATIENTS WITH HYPOCHROMIC ANEMIA AND SMALL RED BLOOD CELLS
5 PATIENTS WITH ORTHOCHROMIC ANEMIA AND RED BLOOD CELLS OF NORMAL OR INCREASED VOLUME
ALL PATIENTS RECEIVED REDUCED IRON 0.5 GM T.I.D.
HEMOGLOBIN - PER CENT
APPROXIMATE WEEK OF PREGNANCY

Chart 6.—The effect of the administration of reduced iron on the hemoglobin level of pregnant women with hypochromic anemia and its lack of effect in cases of anemia with normal color index and normal or increased average erythrocyte volume.

iron preparation to all pregnant women regardless of the actual level of the hemoglobin, if an accurate erythrocyte count and hemoglobin determination by a standardized method reveal a low color index or if the erythrocyte count and hematocrit determination give an average red blood cell volume of less than 85 cubic microns.

Those subjects comprising the second group, in whom the anemia fails to respond to iron, were frequently

12. Strauss, M. B., and Castle, W. B.: Studies of Anemia in Pregnancy: Gastric Secretion in Pregnancy and the Puerperium, Am. J. M. Sc. **184**: 655 (Nov.) 1932.

13. Strauss, M. B., and Castle, W. B.: Studies of Anemia in Pregnancy: The Relationship of Dietary Deficiency and Gastric Secretion to Blood Formation During Pregnancy, Am. J. M. Sc. **194**: 663 (Nov.) 1932.

14. Mettier, S. R., and Minot, G. R.: The Effect of Iron on Blood Formation as Influenced by Changing the Acidity of the Gastroduodenal Contents in Certain Cases of Anemia, Am. J. M. Sc. **181**: 25 (Jan.) 1931.

found to possess red blood cells of relatively large volume. However, unlike the macrocytes of pernicious anemia, their average diameter approximates the normal value. It may be inferred that these erythrocytes were less biconcave than the normal cell, and consequently the phenomenon may more accurately be defined as spherocytosis than as macrocytosis.[15] Recent studies, summarized on chart 7, have shown that there is an

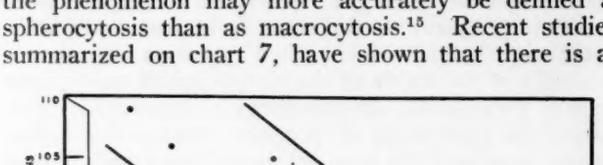

Chart 7.—The inverse relation between the level of the serum albumin and the average volume of the erythrocytes observed on pregnant women without iron deficiency anemia.

inverse relation between the average volume of the erythrocytes and the level of the serum albumin in pregnancy, except in cases of iron deficiency anemia in which true microcytosis occurs. Since the relation between the cell volume and the colloid osmotic pressure was found to be less definite, it is probable that the swelling of the erythrocytes cannot be explained solely on an osmotic basis.[16]

It was observed that patients with this type of blood change and anemia of hypoplastic nature frequently underwent improvement after admission to the hospital, where they received a better diet than that to which they had been accustomed, particularly in respect to the protein supplied. The protein content of the University Hospital general diet averages approximately 65 Gm. daily. Supplementing this diet by 1,000 cc. of milk daily has led to correction of the anemia, restoration of the average erythrocyte volume to normal, and increase in the serum albumin. It is believed that the beneficial effects of the milk supplement may be attributed to its supply of about 33 Gm. additional protein daily of high biologic value. Charts 8 and 9 depict the responses of the blood to iron and protein, respectively, on the part of two pregnant women with contrasting types of anemia.

With the collaboration of Miss Jean Kyer, studies have been made of the effects of pregnancy on the blood of albino rats maintained on diets supplying variable amounts of iron and protein. The details of this work will be published in a separate communication. Rats receiving a diet low in iron developed a slight degree of anemia characterized by hypochromia and microcytosis, but in this connection it should be emphasized that the iron requirement of rats during pregnancy is relatively much greater than that of human beings because of the large size of the litter and the rapid course of gestation. On the other hand, a low protein diet, containing an excess of iron, led to severe anemia with red blood cells of increased volume. Rats receiving an abundance of protein and a moderate supply of iron showed an actual increase during pregnancy of the erythrocyte count and hemoglobin value, without alteration of erythrocyte size.

15. Haden, R. L.: The Mechanism of the Increased Fragility of the Erythocytes in Congenital Hemolytic Jaundice, Am. J. M. Sc. **188**: 441 (Oct.) 1934.

16. Rottschaefer, E. S., and Bethell, F. H.: Simultaneous Studies of the Colloid Osmotic Pressure of the Blood Serum and Changes in Erythrocyte Form During Pregnancy, Proc. Am. Soc. Biol. Chemists, March 1936.

CONCLUSIONS

1. Studies were made of the blood of sixty-six healthy young women during the last trimester of pregnancy, and similar observations were obtained from fifty healthy nonpregnant women of the same age group. In 70 per cent of the pregnant subjects the blood values were too low to be accounted for solely by increased plasma volume with consequent blood dilution.

2. Anemia in pregnancy is commonly due either to preexisting iron depletion or to an inadequate intake of protein of high biologic value during gestation. Rarely it is of the pernicious type amenable to liver or stomach therapy.

3. A lack of iron may be recognized before the development of actual anemia by the presence of a lowered color index or of red blood cells of less than normal size. In such cases the administration of an inorganic iron preparation in adequate dosage is indicated.

4. Anemia dependent on protein deficiency, characterized by a normal color index and by red blood cells of normal or increased volume, may be prevented or corrected by a suitable diet.

ABSTRACT OF DISCUSSION

DR. R. B. SCHUTZ, Kansas City, Mo.: A study of deficiency diseases in pregnancy is of extraordinary interest, but in searching for etiology one is easily driven to philosophy. Why is it that the so-called physiologic changes in pregnancy so often become exaggerated and produce vicious types of disease? One

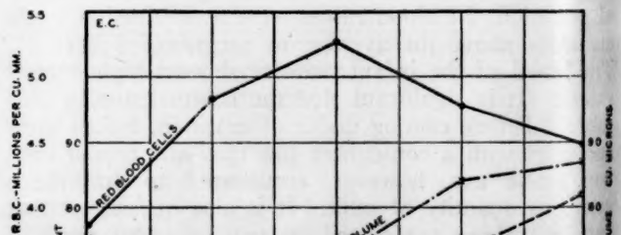

Chart 8.—The effect of the administration of reduced iron to a patient with hypochromic and microcytic anemia of pregnancy.

wonders whether primitive women suffered the deficiencies that modern women have. Are we proving that after all the fetus is a parasite taking to itself what it will regardless of the source? It is important in the problem of the anemias of pregnancy to consider their possible relation to disorders of the endocrine system. As yet, too little is understood of the relationship of the endocrine glands and the bone marrow. There is no doubt of the profound endocrine changes associated with pregnancy, and as a common source for study material might it not be well to study the bone marrow in pregnancy?

Dr. Bethell mentioned bone marrow studies in his paper but did not specify whether they were made in cases of anemia of pregnancy or in nonpregnant women. I should like to make the suggestion, although I shudder when I think of the implications, that in order to obtain a better understanding of this problem we begin to do marrow biopsies in pregnancy. I, for one, would hesitate to start, but I hope there is some one sufficiently courageous. The progressive nature of these anemias to an almost typical pernicious type suggests that studies in pregnancy might have far reaching effects. There have been a number of papers written on the subject, and each seems to bring us a little closer to the solution. I am particularly interested today in what was said about protein in the diet in its relationship to anemia.

DR. ADOLPH SACHS, Omaha: I made a rather exhaustive study of the copper and iron in twenty-five normal pregnant women taken at random. As is well known, there is a reciprocal relationship between copper and iron in the whole blood. The copper probably acts as a catalyzer. In normal women—nonpregnant women—there is an average of 45 mg. of iron per hundred cubic centimeters of whole blood and an average of 131 micrograms of copper. As the iron goes down the copper goes up. I at no time have found a copper deficiency. The pregnant woman has below the average of iron in her blood. She will average 40 mg. of iron per hundred cubic centimeters instead of 45 mg. She will average 195 micrograms of copper, whereas the normal woman averages 131. Half of this copper is to be carried over to the fetal liver for future

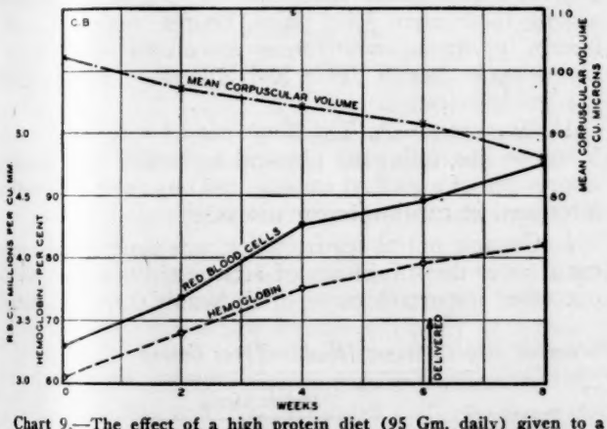

Chart 9.—The effect of a high protein diet (95 Gm. daily) given to a patient with anemia characterized by normal color index and increased average erythrocyte volume.

supply, because in the fetus there is only 82 micrograms per hundred cubic centimeters of cord blood, and there is an excess of iron averaging about 50 mg. per hundred cubic centimeters of cord blood. So it is the mother who is carrying the copper over to the fetal storehouse. In the anemia of pregnancy there are two types, the physiologic type and the true anemia. Whenever there is any anemia, the copper will rise and the iron will go down. The same occurs with a pregnant woman, but she has a double purpose for carrying this copper. The true anemia will produce a hypoferronemia and in addition she has her hypercupremia not only to supply the fetal storage but to mobilize copper for the mother's anemia. I have found that the polycythemia of the infant is not due to anoxemia, as was once thought, because the work has been done on cesarean sections under local anesthesia and rapid delivery; however, the polycythemia still exists with a low copper and a high cord blood iron.

DR. FRANK H. BETHELL, Ann Arbor, Mich.: The nature of the interference with blood formation in pregnancy occasioned by deficient protein is not well understood. In the presence of lowered plasma albumin the red blood cells tend to become more spherical, with coincident reduction of their number. The possible bearing on hematopoiesis of derangements of function of the endocrine glands is a subject on which little information exists in either the pregnant or the nonpregnant state. Also worthy of further investigation is the relationship of other mineral constituents of the diet, particularly calcium, both to the assimilation and to the utilization of iron. The work of Dr. Sachs and his colleagues on the reciprocal relationship of the iron and copper content of the blood has provided an explanation of our failure to obtain better results from the administration of copper as a supplement to iron than from iron medication alone in the treatment of the iron deficiency anemias.

DISAPPEARANCE OF THE PHYSICAL SIGNS OF RHEUMATIC HEART DISEASE

EDWARD F. BLAND, M.D.
T. DUCKETT JONES, M.D.
AND
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We are presenting in this report observations on the disappearance of certain physical signs considered characteristic of rheumatic involvement of the heart. The appearance of so-called organic murmurs during the course of rheumatic fever or chorea is generally accepted as evidence of valve injury. Cardiac enlargement when present lends further support to the clinical impression of extensive involvement of the heart. It has been shown recently that dilatation alone may be an important factor during severe rheumatic infection responsible in some instances for cardiac murmurs; especially for a mid-diastolic rumbling sound at the cardiac apex previously considered indicative of mitral stenosis.[1] It is evident, however, from both clinical observation and postmortem study that with demonstrable involvement of the heart during rheumatic fever the mitral valve rarely escapes and, furthermore, the aortic cusps are injured in over half the cases. The persistence of characteristic murmurs after subsidence of the infection constitutes, therefore, our most reliable indication of residual valve injury.

It is well known that the signs of valvular disease which appear during rheumatic fever or later usually persist throughout life and often progress during subsequent years. It is less well known, however, that these signs of cardiac involvement may occasionally regress and ultimately disappear. Isolated instances have been observed and commented on by numerous clinicians but accurate data on the incidence and subsequent course of this fortunate group have not been recorded. Coombs [2] has expressed the opinion that in as many as 31 per cent the signs of rheumatic heart disease once present may later disappear. To us this figure appears too high and his published data as to both the original condition and the subsequent observations are inadequate for critical analysis. A comprehensive study of rheumatic infection and heart disease in progress now for a number of years has presented an opportunity to investigate further this occasionally observed but imperfectly understood aspect of the course of rheumatic heart disease in young people.

CLINICAL MATERIAL

The material dealt with in this report has been assembled from two sources. Since 1920 approximately 1,500 children and adolescents with rheumatic

From the House of the Good Samaritan and the Massachusetts General Hospital.
The expenses of this study have been defrayed by a grant from the Commonwealth Fund.
Read before the Section on Practice of Medicine at the Eighty-Seventh Annual Session of the American Medical Association, Kansas City, Mo., May 13, 1936.

1. Bland, E. F.; White, P. D., and Jones, T. D.: The Development of Mitral Stenosis in Young People, Am. Heart J. **10**: 995 (Dec.) 1935.
2. Coombs, C. F.: Rheumatic Heart Disease, New York, William Wood & Company, 1924.

fever or chorea have received prolonged bed care and intensive study at the House of the Good Samaritan during the active stage of their disease. The average period of hospitalization has been from three to four months, and not infrequently as long as from one to two years. Furthermore, a unique aspect of the study has been the subsequent observation at frequent intervals of the majority of this large group. We ourselves have done the greater portion of this follow-up study. Invaluable aid has been rendered by the medical and social service departments of the general hospitals in Boston. From this large group of 1,500 only those patients have been included (1,184 in number) in whom the subsequent follow up has been sufficiently long to yield useful data. The average duration of this subsequent observation from the onset of rheumatic infection to the present time has been approximately ten years. A smaller and similar age group from the Massachusetts General Hospital, also followed by us, has been included primarily for comparison, but for our purpose the two groups are in all respects comparable. Pertinent details relating to these two groups are summarized in table 1. It is to be emphasized that the data represent observations on the course of rheumatic infection and its cardiac complications during the first decade after the onset in young people only and is not necessarily indicative of the course of rheumatic heart disease in later life. The average age for the group at the time of onset of rheumatic infection or chorea was 8 years, so that this study embraces essentially the period from 8 to 18 years, and hence the decade during which rheumatic infection is most prevalent and most damaging to the heart. Only that portion of this extensive study relevant to the regression and disappearance of the physical signs of rheumatic heart disease has been included in this communication.

TABLE 1.—*Sources of Material*

	House of Good Samaritan Group	Massachusetts General Hospital Group	Combined Series
Number of patients (rheumatic fever or chorea)	1,184	209	1,393
Rheumatic heart disease (clinically demonstrable)	853 (71%)	147 (70%)	1,000 (70%)
Duration follow-up (rheumatic heart disease group)			
Living	10.5 yrs. (619 cases)	9.6 yrs. (109 cases)	10.3 yrs. (728 cases)
Dead	5.6 yrs. (234 cases)	5.2 yrs. (38 cases)	5.5 yrs. (272 cases)

TABLE 2.—*Present Status: A Ten-Year Study of Rheumatic Heart Disease Group*

Total Patients	Dead	Disappearance of Physical Signs	Remainder
1,000	272	83	645

In table 2 we have indicated the general course of events for the group of 1,000 patients with clinical evidence of heart disease during the first ten year period. It is to be noted first that 272 (27 per cent) are dead. A recrudescence of rheumatic infection was directly responsible for the fatal issue in the majority. We are interested primarily, however, in the group of eighty-three patients in whom all evidence of valvular disease subsided.

DIAGNOSTIC CRITERIA

For the purpose of this and comparable future studies we believe it essential to define clearly the diagnostic criteria accepted in this report as clinical evidence of rheumatic valvular disease of the heart. A number of borderline cases have been excluded.

I. *Etiology.*—All patients in this group of eighty-three in whom the physical signs of rheumatic heart disease later subsided had at the time of hospitalization, or within the recent past, clinical manifestations generally considered rheumatic in origin. Frequent among these were joint pains, chorea, nodules, nosebleeds, erythema multiforme associated with unexplained poor health, fever and laboratory evidence of low grade infection.

II. *Structure.*—A. The diagnosis of valve defects is based on the following physical signs and the clinical impression of a staff of experienced observers especially interested in cardiovascular disease:

1. Organic mitral regurgitation was considered present if after the subsidence of active infection and without other important cause of ill health there remained a loud systolic murmur heard with maximal intensity at the cardiac apex which was uninfluenced significantly by respiration or change in position of the patient. We recognize that this represents perhaps a controversial group and that the loud and persistent murmur present in these patients may be due occasionally to other and unrecognized factors. However, we are convinced from clinical and postmortem study that structural alteration in the mitral cusps is directly responsible for the cardiac murmur in the majority of this group.

2. Mitral regurgitation and stenosis were diagnosed clinically in the presence of a blowing systolic and a low pitched murmur or rumble in mid or late diastole at the cardiac apex. Attention has been called to the frequent discrepancy between the clinical diagnosis and

TABLE 3.—*Disappearance of Physical Signs of Rheumatic Heart Disease (Eighty-Three Cases)*

	Original Condition						Duration of Physical Signs of Rheumatic Heart Disease	Present Status					
	Cardiac Enlargement							Murmurs		Cardiac Enlargement			
	Clinical			X-Ray							X-Ray		
Murmurs	N.E.	S.E.	M.E.	N.E.	S.E.	M.E.		Absent	Functional Systolic	Clinical, Absent	Absent	Slight	Total Years Observed
Mitral systolic (26 cases)	12	13	1	8	7	1	4.5 yrs.	16	10	26	12	3	10.3
Mitral systolic and diastolic (53 cases)	19	26	8	3	12	7	4.5 yrs.	34	19	53	19	3	9.7
Mitral systolic and diastolic and aortic diastolic (3 cases)	0	2	1	0	1	0	3.3 yrs.	2	1	3	1	0	8.3
Mitral systolic and aortic diastolic (1 case)	1	0	0	0	0	0	4.0 yrs.	1	0	1	0	0	11.0
Totals (83 cases)	32	41	10	11	20	8	4.4 yrs.	53	30	83	32	6	9.9

N.E., No enlargement.
S.E., slight enlargement.
M.E., Moderate to marked enlargement.

the extent of structural alteration found post mortem in many of these patients, especially as regards the interpretation of the diastolic rumbling sound as indicative of actual narrowing of the mitral orifice. With this reservation we have retained the term "mitral regurgitation and stenosis" for this group. No instance of "pure" mitral stenosis of the so-called adult type with a harsh late diastolic murmur ending with crescendo in a slapping first sound with subsequent disappearance was encountered in these children.

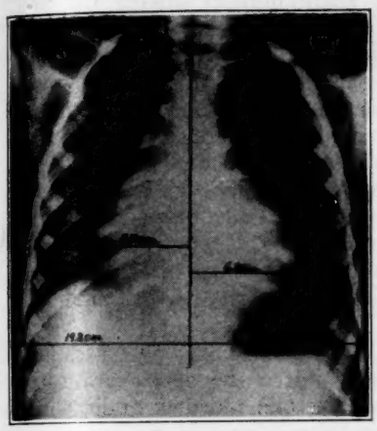

Fig. 1.—Teleroentgenogram (at 7 feet) showing marked cardiac enlargement (dilatation) during severe rheumatic fever in a boy aged 7 years. A loud apical systolic murmur was present at this time.

3. Aortic regurgitation was considered present if there was audible an early diastolic murmur best heard either at the aortic or at the pulmonic area or down the left side of the sternum. In each of the relatively few instances with subsequent regression in which this valve defect was diagnosed, the murmur was soft and of slight intensity. No instance of free aortic regurgitation with subsequent disappearance has been encountered.

B. Cardiac size is considered arbitrarily under three divisions:

1. No enlargement is considered present if the point of maximal intensity of the cardiac apex and the left border of dulness are located either in or within the midclavicular line in the fourth or fifth interspace.

2. Slight enlargement is considered present if the apex impulse and the left border of cardiac dulness are from 1 to 2 cm. outside the midclavicular line in the fifth intercostal space.

3. Moderate to marked enlargement is diagnosed if the apex impulse and the left border of cardiac dulness are more than 2 cm. beyond the midclavicular line.

Many of the patients have been examined by x-ray both at the time when rheumatic heart disease was considered present and later when the physical signs of valvular disease had subsided. Discrepancy between the estimate of cardiac size made in this way and that made from physical examination has been infrequent.

DISAPPEARANCE OF PHYSICAL SIGNS

In table 3 we have assembled and summarized the pertinent data relating to the subsequent disappearance of physical signs considered indicative of rheumatic heart disease in this group of eighty-three patients. We have arranged these patients in four major groups according to the cardiac murmurs on which the diagnosis of valvular disease was based. In the second section of the table we have indicated the clinical estimate of the size of the heart together with the results of x-ray examinations when such were available. Finally, in the division of the table on the right we have summarized the present status of this group, all of whom on physical examination show no clinical evidence of residual cardiac disease. A review of the physical signs at the time rheumatic heart disease was originally diagnosed reveals that uncomplicated mitral regurgitation was present in twenty-six patients. In approximately half of these (fourteen) there was enlargement of the heart. In fifty-three patients mitral stenosis and regurgitation were considered present and in two thirds of these there was cardiac enlargement. In addition to mitral regurgitation and stenosis there was also slight aortic regurgitation in three others, all of whom had enlargement of the heart. Finally, in one additional patient without cardiac enlargement there were present the murmurs of mitral regurgitation and slight aortic regurgitation.

It is to be noted that of the total group of eighty-three patients previously considered to have rheumatic valvular disease no murmurs now can be elicited in any position or after exercise in fifty-three patients. In thirty instances, however, there is still audible a faint and inconstant systolic blow best heard in the majority in the pulmonary area and considered functional in origin. There remain no diastolic murmurs in any instance. The size of the heart on physical examination is now within the normal range in each patient, but, as indicated in the table, fluoroscopic examination reveals a borderline and suspicious prominence in the vicinity of the pulmonary conus in four patients of the group of thirty-eight who have recently had x-ray examinations. In two others the heart remains at full size in the region of the left ventricle. Reproductions of the x-ray films of one of the latter patients is shown in the accompanying illustrations and show in figure 1 well marked enlargement of the heart during active rheumatic infection. Figure 2, taken one year later after all clinical evidence of heart disease had subsided, shows the heart to be considerably smaller but still full sized. A loud apical systolic murmur previously present has completely disappeared. No attempt has been made in this study to apply the "angle of clearance" tests during fluoroscopy recently discussed by Wilson[3] and her associates.

Some indication of the course of events and the manner of disappearance of these murmurs is shown in table 4. In those patients who were considered to have mitral valve involvement on the basis of apical systolic and diastolic murmurs, the diastolic murmur was invariably the first to disappear. Occasionally this apical diastolic rumble subsided within a few months after the onset of rheumatic infection, during the period while the patient was convalescing and was still under observation in the hospital. This further supports our previously expressed opinion that cardiac dilatation during active rheumatic infection is often a significant factor responsible for this murmur as well as for a blowing systolic murmur at the cardiac

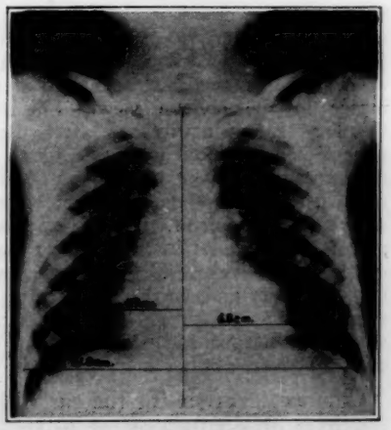

Fig. 2.—Teleroentgenogram (at 7 feet) showing a remarkable diminution in size of the cardiac shadow in the same patient as in figure 1 one year later, after all evidence of active infection had subsided. The heart is now clinically normal and no murmurs are audible.

3. Wilson, May G.: Clinical Radioscopic Studies of the Heart in Children, Am. J. Dis. Child. 47: 750 (April) 1934.

apex. Therefore in those instances, of which there were sixteen, in which the physical signs of apparent valvular disease subsided within the first year, we suspect that in the majority cardiac dilatation alone was primarily responsible for the murmurs. The usual sequence of events, however, has been a more gradual regression over a period of years. The ultimate disappearance has occurred most frequently during the first five years, as is shown in table 4. An unexpected

TABLE 4.—*Duration of Physical Signs of Rheumatic Heart Disease (Eighty-Three Cases)*

Years	1-2	3-4	5-6	7-8	9-10	10+	?
Cases	18	25	17	11	5	1	6

accident provided us a unique opportunity to study post mortem the valve cusps in a single patient of this group in whom we had observed the gradual and complete disappearance of the physical signs of rheumatic valvular disease known to have been present six years before subsidence. We record herewith pertinent details of this important case:

REPORT OF CASE

C. C., a girl, aged 13 years, had scarlet fever, which was followed promptly by rheumatic fever in 1927. At the Boston City Hospital a diagnosis of rheumatic heart disease was made and she was transferred to the House of the Good Samaritan for convalescence. Physical examination on entry and throughout her four months stay showed the heart to be slightly enlarged with the apex impulse and the left border of cardiac dulness in the fifth interspace 1 cm. outside the midclavicular line. Maximal at the apex were audible a loud blowing systolic murmur and a low pitched mid-diastolic murmur. Along the left sternal border was also heard a definite soft blowing diastolic murmur immediately after the second sound. A diagnosis of mitral regurgitation and stenosis and slight aortic regurgitation was made. She remained well after leaving the hospital and reported at frequent intervals for follow-up examination. In 1930 (three years after the onset) the aortic diastolic murmur had disappeared. In 1933 (six years after the onset) the mitral diastolic rumble subsided, leaving a moderately loud apical systolic murmur and third sound. In 1934 and 1935 there remained only an insignificant and distant apical systolic murmur, which disappeared completely with inspiration. Fluoroscopic examination at this time showed the heart to be normal in size, in shape and in pulsations, with no evidence of abnormal auricular or pulmonary conus prominence in the oblique view. She continued well, but in October 1935, four months after the last examination, the patient died unexpectedly in a dentist's chair immediately after the extraction of a tooth under gas-oxygen anesthesia. Postmortem examination (medicolegal) revealed slight but definite scarring of the mitral cusps of sufficient degree to warrant the pathologic diagnosis on macroscopic examination of a "healed" rheumatic endocarditis. There remained, however, no important deformity and, furthermore, there was no detectable scarring of the aortic cusps. The heart weighed 275 Gm., a figure within the normal range for this age (20 years). The cause of the sudden death remains obscure.

The explanation for the early blowing basal diastolic murmur originally present in this patient is not clear. It is possible that a healed scar on the aortic cusps may have been so slight as to escape notice post mortem. The previous injury to the mitral cusps had healed in such a fashion that the residual scar was of slight degree and insufficient to produce characteristic murmurs of mitral valve disease during the two years prior to this patient's death.

COMMENT

In this series of 1,000 young patients with the physical signs of valvular disease of the heart who have been examined at frequent intervals during the first decade after the onset of rheumatic infection, we have observed a regression in these physical signs in a considerable number and the total disappearance of all clinical evidence of heart disease in eighty-three instances. In a few, cardiac dilatation during the stage of active rheumatism may have been responsible for the murmurs usually considered characteristic of valvular disease. If this is true, it is the probable explanation for the relatively rapid disappearance of the cardiac murmurs in a small number during the first year.

It is our belief, however, that the majority of this group of eighty-three patients had injury of the valve cusps (usually the mitral) at the time of rheumatic fever. That it was of minimal degree in each instance seems most likely, so that the residual scarring has produced no significant deformity or characteristic murmurs. It is of interest that, although cardiac enlargement (dilatation and possibly pericarditis) was in some cases of extreme degree, it has in each instance subsided. Six borderline cases (by x-ray examination) remain questionable.

It is to be noted that we have not observed in a single instance in these children the disappearance of either (1) a very loud diastolic murmur ending in a loud crescendic presystolic roll or (2) a loud aortic diastolic murmur and the peripheral circulatory signs of free aortic regurgitation.

It will be of considerable interest and importance to follow further this group of eighty-three patients (one is now dead) to determine whether in some at least the signs of valvular disease (especially mitral stenosis) may later and insidiously reappear without the recurrence of clinically recognizable rheumatic infection. Although as yet the data are inconclusive, we have evidence from a group of patients with so-called potential rheumatic heart disease which suggests that later mitral stenosis may slowly develop in a few instances.

CONCLUSIONS

From a follow-up study of 1,000 children and adolescents with rheumatic heart disease it has been shown that:

1. Certain physical signs considered characteristic of valvular disease may occasionally regress and ultimately disappear.
2. This favorable sequence of events was observed during the course of ten years in eighty-three instances (8.3 per cent).
3. Postmortem observations following an unexpected accident have been recorded in one case.
4. It is probable that in the majority minimal scarring without significant valve deformity remains, notwithstanding the absence of characteristic murmurs. Cardiac dilatation alone is occasionally responsible for the physical signs of valvular disease during active rheumatic infection.

25 Binney Street.

ABSTRACT OF DISCUSSION

DR. FRED M. SMITH, Iowa City: Recession of cardiac signs in rheumatic heart disease, particularly cardiac enlargement, is rather common, and occasionally a striking change in this respect is noted. The disappearance of what appears to be a well established murmur, however, is a feature that has not been emphasized. I am inclined to believe that the murmur disappears far more often than is suspected in the cases in which there is a minimal involvement of the heart. It is well to bear in mind that there are two factors primarily responsible for the cardiac disability in this form of heart disease: first, the invasion of the myocardium by the rheumatic infection;

second, the mechanical handicap imposed by the diseased valves. These observations bring up an important point with reference to the pathology. Prior to a few years ago attention was focused on the endocardial lesions. It is now known that this is one of the expressions of a valvulitis and that all structures of the heart may be involved to a varying extent by the infection. In those who die within a few months or a few years from rheumatic heart disease, the damage to the myocardium is the outstanding feature. In those who live twenty or thirty years, however, the damage to the myocardium may be minimal, whereas the involvement of the valve structures is the conspicuous feature. Between these extremes the two factors involvement of the myocardium and the mechanical handicap imposed by the damaged valve structures participate to a varying extent in the production of the cardiac disability. It is doubtful that the murmur ever completely disappears following a significant involvement of the valves. In most of the cases cited by the authors it is probable that the disappearance of the infection from the myocardium was for the most part responsible for the changes observed in the physical signs.

DR. P. T. BOHAN, Kansas City, Mo.: The interesting question brought up in this paper is why patients develop a diastolic murmur at the apex without any definite narrowing of the mitral orifice. The suggestion made by the authors that this murmur may be due to a loss of tone or disturbed function of the myocardium seems plausible to me. A patient seen recently has a direct bearing on this point: A girl of 16, suffering from a very high grade gonorrheal arthritis, two months before her death developed a very distinct middiastolic murmur at the apex, and the diagnosis of mitral stenosis was made. At autopsy we were very much surprised to find there was not the slightest sign of stenosis of the mitral valves, nothing but some vegetations along the valve margins, rather typical of rheumatic endocarditis, and in the aorta there was an ulcer about 1 cm. in diameter. Direct smears from this ulcer showed gonococci. There was only moderate dilatation of the heart in this case. At the time of the autopsy it was thought that a probable cause for the apical diastolic murmur was a relative stenosis of the orifice due to an edema, but histologic studies of the myocardium showed granulomatous foci, interpreted by the pathologist Dr. F. C. Helwig as probably fibrosing Aschoff bodies. The autopsy in this case tended to support the suggestion made by the authors that a diastolic murmur at the apex may be due to disturbed function of the myocardium. Another point I should like to emphasize is that the authors made the diagnosis of mitral regurgitation rather frequently in these children. This reminds us of the fact that we should not get too scientific in minimizing the importance of a systolic murmur at the apex. For a number of years following an attack of endocarditis the only evidence, if any, of mitral disease may be a systolic murmur at the apex with or without demonstrable cardiac hypertrophy. The sclerosing process that gives rise to a stenosis is very slow. I have often felt that many of the patients seen at middle life or older with a pure mitral stenosis suffered in their youth from a mild attack of endocarditis that had gone unrecognized. It is to be hoped that few, if any, of the eighty-three cases that the authors observed for ten years with negative results will show up later in life with a pure mitral stenosis.

DR. WILLIAM J. KERR, San Francisco: I would suggest that there may be a type of murmur which has not, up to this time, been recognized. I believe that the diastolic murmur which the authors have discussed this morning, occurring in the acute stages of rheumatic fever and found in a number of other conditions such as severe anemias and leukemias, is due to relative insufficiency of the pulmonary valve. In these patients, if one listens very carefully near the apex of the heart, one may be able to recognize frequently a presystolic element, if the rate is not too fast, as well as a middiastolic element. It is my opinion that this murmur is analogous to the Austin Flint murmur in aortic insufficiency but in this instance is associated with pulmonary insufficiency. It is a murmur of low intensity because of the low pressure in the pulmonary circuit, which is further reduced during the failure of the heart. If one listens over the base of the heart in these patients, one will find on the pulmonary side a very early short diastolic murmur, which is like the Graham Steell murmur of pulmonary valvular insufficiency. I would suggest, therefore, that in those patients with a systolic murmur at the apex due to relative mitral insufficiency one should expect evidence of failure of the right side of the heart also. The enlargement of the right side of the heart shown in the illustrations by the authors is to be expected in these patients. Clinical experience suggests that the ventricular myocardium is generally involved. Further study will, I am sure, confirm my opinion that dilatation of the pulmonary valve is the origin of the diastolic and presystolic murmurs arising early in rheumatic fever.

DR. T. DUCKETT JONES, Boston: It is to be regretted that so considerable an amount of the reported study is concerned with murmurs and their interpretation. This is especially true since one may with relative ease care for rheumatic fever and heart disease subjects without many of the older ideas of the significance of murmurs being considered. In this connection I should like to stress one point. In caring for patients with rheumatic fever and heart disease the important pertinent features are relative to whether or not there is active rheumatic fever or active carditis in progress. The determination of this is important from the point of view of prognosis as well as of therapy. As pointed out in this study, the first five or six years of the life cycle of rheumatic fever in the young subject will usually determine his prognosis. If he escapes repeated recurrences of the disease or the development of severe heart disease there is every chance of his remaining well physically. It is heartening that such an experience is true so often in a large series of patients followed for a period of years. I wish therefore to make the plea to physicians that the important factors in determining the therapy and prognosis in subjects with rheumatic fever and heart disease is the determination of the active disease process rather than the presence or absence of any particular cardiac murmurs.

EFFECTS OF STANDARD, PROTAMINE AND CRYSTALLINE INSULIN ON BLOOD SUGAR LEVELS

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AND
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Chief of Department of Internal Medicine and Research Resident, Respectively, Harper Hospital
DETROIT

During the past few months there have been several reports on the use of protamine insulin in the treatment of diabetes mellitus. The first reports were those of Hagedorn and his co-workers [1] from Copenhagen, who combined insulin with a monoprotamine which was buffered at p_H 7.3, approximating that of blood serum. Root, White, Marble and Stotz [2] reported their clinical results at the same time. More recently Lawrence and Archer,[3] Kerr, Best, Campbell and Fletcher [4] and Sprague and Blum and their associates [5] have reported essentially the same results.

Previously cited investigators stated that the chief advantages of protamine insulin lie in the following observations:

1. The rate of absorption was slower than with regular insulin.

2. Its action on reducing the blood sugar level was more prolonged than the action of standard insulin.

Studies carried out by grant from A. Wineman Fund.
From the Department of Internal Medicine, Harper Hospital.

1. Hagedorn, H. C.; Jensen, B. N.; Krarup, N. B., and Wodstrup, I.: Protamine Insulinate, J. A. M. A. **106**: 177-180 (Jan. 18) 1936.

2. Root, H. F.; White, Priscilla; Marble, Alexander, and Stotz, E. H.: Clinical Experience with Protamine Insulinate, J. A. M. A. **106**: 180-183 (Jan. 18) 1936.

3. Lawrence, R. D., and Archer, Nora: Some Experiments with Protamine Insulinate, Brit. M. J. **1**: 747-751 (April 11) 1936.

4. Kerr, R. B.; Best, C. H.; Campbell, W. R., and Fletcher, H. A.: Protamine Insulin, Canad. M. A. J. **34**: 400-401 (April) 1936.

5. Sprague, R. G.; Blum, B. B.; Osterberg, A. E.; Kepler, E. J., and Wilder, R. M.: Clinical Observations with Insulin Protamine Compound, J. A. M. A. **106**: 1701-1705 (May 16) 1936.

3. Hypoglycemic reactions occurred less frequently and were milder in character when they did occur.

4. Marked fluctuations of the blood sugar level commonly obtained with the use of standard insulin were diminished.

5. Reduction in the number of doses could be made with most patients by using protamine insulin as the evening dose.

6. A single or double dose of protamine insulin administered daily could be used in some cases to replace two or three doses of standard insulin.

The noted disadvantages of protamine insulin were:

1. The instability of the compound, in that it loses potency within from three to four weeks after the solutions have been mixed.

2. The use of two different types of insulin daily, with its attendant responsibility on the patient.

3. Difficulties encountered by the less dexterous patient in handling the substance properly.

Several months ago an improved insulin compound, technically called crystalline insulin, was submitted to us for clinical investigation by Dr. Melville Sahyum of Detroit. This insulin is a crystalline extract prepared from the pancreas. It is claimed that its action is more prolonged than standard insulin. It has the advantage of being as stable as standard insulin and is dispensed in a single solution.

A preliminary clinical report of the actions of standard, protamine and crystalline insulin on blood sugar levels is presented.[6] Two normal subjects and fifteen diabetic patients studied over a period of four months form the basis of this report.

These patients were in the hospital on controlled weighed diets during each period of study. The available dextrose of the diets is divided equally between the three meals, as contrasted to the methods previously described.[7] The meals were served at 8 a. m., noon, and 5 p. m. All patients were observed on each of the three types of insulin for a period of from ten to fourteen days before the blood sugar determinations presented in the accompanying charts were used as the basis for comparison.

In calculating the amount of insulin necessary for the patients in this study it was deemed advisable to keep the total number of units essentially the same as previously required in standard insulin. Thus, in

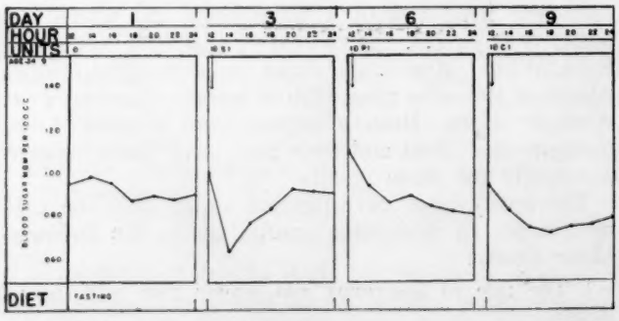

Chart 1.—Comparative action of the different types of insulin on the blood sugar curve in a normal healthy fasting individual.

patients who were receiving three doses of standard insulin daily, the total number of units was redistributed into two doses daily, with the total amount increased or decreased according to the previous twenty-four hour blood sugar curve. An attempt was made to keep the total number of units nearly constant rather than attempt to determine the minimal amounts of protamine and crystalline insulin required. However, in several patients it was necessary to reduce the amount of insulin administered because of the severe hypoglycemic reactions.

To determine the comparative action of the different types of insulin in the normal healthy person, a well

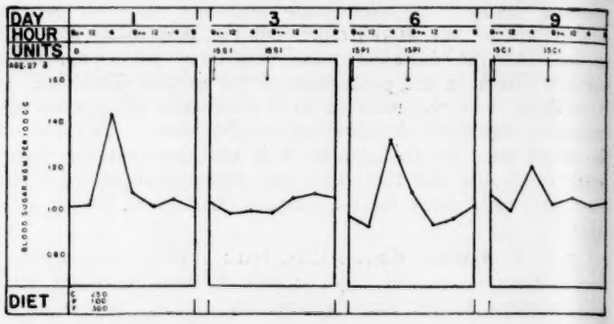

Chart 2.—Comparative action of the different types of insulin on the blood sugar curve in a normal healthy individual on a controlled weight diet.

balanced diet was given previous to the experiment. The individual was fasted for twenty-four hours and blood sugar determinations were taken every two hours over the last twelve hours of the fasting period. This was done to rule out the influence of the previously ingested food on the blood sugar curve. After the normal curve had been established for the subject, the effect of each type of insulin was determined every third day to rule out any possibility of the cumulative effect of previously administered insulin. After twelve hours of fasting, 10 units of each type of insulin was injected subcutaneously.

It will be noted in chart 1 that protamine insulin and crystalline insulin had somewhat similar effects on the blood sugar curve of a normal, healthy subject. The onset of the action of crystalline insulin is more rapid than that of protamine insulin, but its duration is not quite as long. In spite of the lack of a marked hypoglycemic level the subject complained of nervousness, inability to concentrate while reading, and insomnia, which might be interpreted as symptoms indicative of a mild insulin reaction. This occurred with both protamine insulin and crystalline insulin and lasted for approximately one and a half hours. The hypoglycemic level produced by standard insulin was more marked but shorter in its duration.

The next study was the determination of the action of the "insulins" on a healthy subject who was on a normal controlled, weighed diet. Blood sugar determinations were made every four hours throughout the twenty-four hour period. After the normal blood sugar level had been determined without insulin the patient was given 15 units of one kind of insulin at 7 a. m. and 7 p. m. on the days of the blood sugar determinations, and this routine was followed with each type of insulin. These studies were made at intervals of three days because of the reasons cited in the previous experiment. In chart 2 it is seen that standard insulin had a tendency to flatten the entire twenty-four hour curve, whereas protamine insulin and crystalline insulin had only slight effects on the curve. It is interesting to note that following the administration of either protamine or crystalline insulin the subject had

6. Protamine Insulin supplied by Eli Lilly Company, Indianapolis. Crystalline Insulin Compound supplied by Frederick Stearns & Co., Detroit.

7. Hagedorn, Jensen, Krarup and Wodstrup.[1] Root, White, Marble and Stotz.[2]

mild symptoms of hyperinsulinism between 1 and 2 a. m. However, the blood sugar determinations made at that time were normal, even though nervousness, insomnia and perspiration of the hands were present.

These curves confirm the observations of previous investigators on the effect of standard insulin and protamine insulin. Crystalline insulin affects the curve more slowly than standard insulin but more rapidly than protamine insulin, and the duration of its action on the blood sugar level is not as long.

CLINICAL STUDIES OF DIABETIC PATIENTS

The diabetic patients in the report were for the most part taken from the diabetic clinic of the outpatient department of Harper Hospital. They were selected for study because of (1) the completeness of the previous records, in that all these patients had been observed in the clinic since the onset of their disease, (2) the difficulty of their being controlled on three daily doses of standard insulin, and (3) the marked fluctuation of blood sugar levels and the reactions accompanying these changes. The ages of these patients varied between 4 and 53 years. The duration of their disease (onset of symptoms) varied between one and twelve years, with a

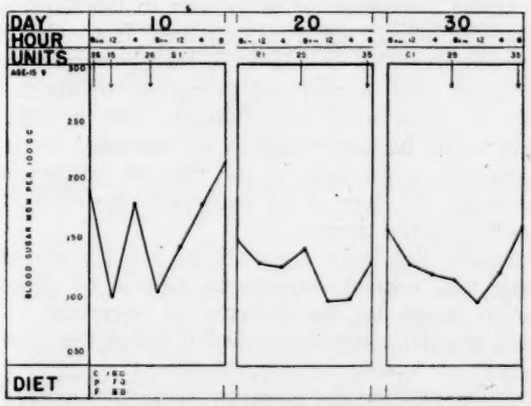

Chart 3.—Action on patient with severe diabetes exhibiting marked hypoglycemia and hyperglycemia with standard insulin.

general average of four and one-half years. All patients presented in this study were diabetic without other disease complications. Physical and laboratory examinations failed to reveal any condition, such as foci of infection, that would in any way alter the blood sugar curves.

The diets used were of two main types: i. e., the high carbohydrate low calory diet and the moderate carbohydrate maintenance diet.

In calculating the insulin dosage of the diabetic patient, no attempt was made to reduce the total number of units of insulin administered unless reactions occurred. Thus a standard of comparison was maintained throughout the study. The time of injection of protamine and crystalline insulin was kept constant in that it was administered at intervals of twelve hours.

Chart 3 shows the effects of protamine and crystalline insulin in reducing the marked fluctuations in the blood sugar levels throughout the twenty-four hour period. The "peaks and valleys" associated with the use of standard insulin were eliminated. The glycosuria was greatly reduced.

The case described in chart 4 exhibited the single "dip" type of blood sugar curve with standard insulin. The blood sugars were usually normal or somewhat lower, at times associated with reactions, between midnight and 2 a. m. The patient's fasting blood sugar level on the following morning invariably returned to the hyperglycemic level. Several attempts to eliminate the fluctuations of the blood sugar level were made by first giving the third dose of standard insulin later in the evening. This resulted only in a change in the time at which the hyperglycemia occurred. The addi-

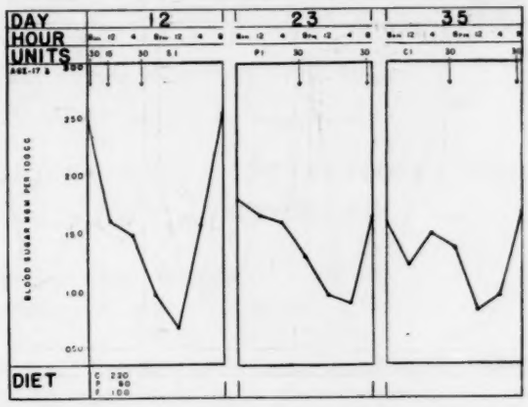

Chart 4.—Action on patient with severe diabetes exhibiting single "dip" hypoglycemia curve with standard insulin, controlled by protamine insulin and crystalline insulin.

tion of a fourth dose of standard insulin reduced the fluctuations in the curve. However, the latter regimen was difficult for the patient to carry out because of his plan of living. When protamine or crystalline insulin was substituted, the flattening of the entire blood sugar curve resulted. Although there was a marked lowering of the blood sugar during the early hours of the morning, below the levels obtained with use of standard insulin, no severe reactions occurred and the fasting blood sugar did not return to its previous hyperglycemic level.

The effects of the various types of insulin are shown in chart 5. Here, as in several other patients observed, it was noted that crystalline insulin was more rapid in the onset of its action than protamine insulin. The duration of its effect on the blood sugar curve seems to be from two to four hours shorter.

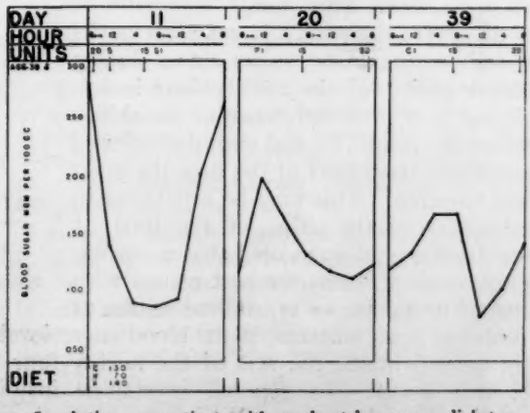

Chart 5.—Action on patient with moderately severe diabetes. Rate of onset of crystalline insulin is more rapid than protamine insulin.

The case described in chart 6 was extremely difficult to control with three or four doses of standard insulin. On the same diet and insulin regimen the patient would have a marked hypoglycemic reaction one day, but on the following day at the same hour hyperglycemia would be noted. This patient was extremely

sensitive to standard insulin and 2 or 3 additional units would precipitate a hypoglycemic reaction. Because of the lack of cooperation and illiteracy of the family it was impossible to establish an insulin regimen outside the hospital. However, with the use of two doses of either protamine insulin or crystalline insulin daily, the fluctuations in the blood sugar level disappeared. The severe hypoglycemic reactions were eliminated and the patient stated that she felt better.

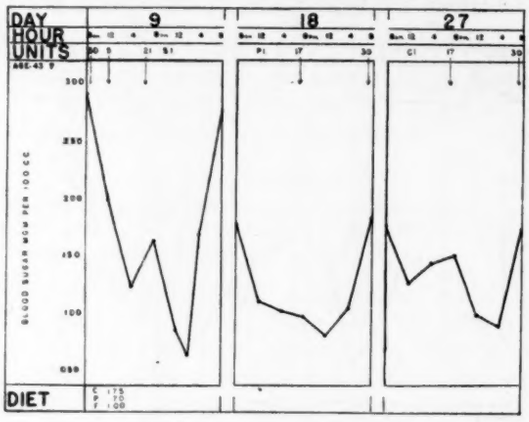

Chart 6.—Action on patient with diabetes complicated by gangrene of foot.

The next step in this study was to determine the comparative action of standard, protamine and crystalline insulin when only one type of insulin was given twice daily, as contrasted with the administration of standard insulin as the morning dose and protamine or crystalline insulin as the evening dose (chart 7). As has been previously cited, it was possible to lower the blood sugar curve during the period of food with protamine and crystalline insulin. However, the use of standard insulin in the morning and either protamine or crystalline insulin in the evening produced the best results, as evidenced by the flattening of the entire twenty-four hour blood sugar curve. Lawrence[3] has recently stated that protamine insulin does not adequately cope with the carbohydrate ingested during the entire day and does not prevent the increase in the blood sugar levels after meals, especially in cases of severe diabetes. It reacts remarkably well on the blood sugar curve during the latter period of the twenty-four hours. He found very little difference in the ability of protamine insulin to deal with the ingested carbohydrate regardless of the time the insulin was injected. This may be attributed to the slowness of its action or the time of administration. It was noted that a fasting hyperglycemia prevents the best results with the use of protamine or crystalline insulin as the morning dose, whereas, if the blood sugar level was within normal limits, the rest of the twenty-four hour curve was lower. In general, crystalline insulin is more efficacious than protamine insulin in dealing with the blood sugar level during the period of ingestion of food.

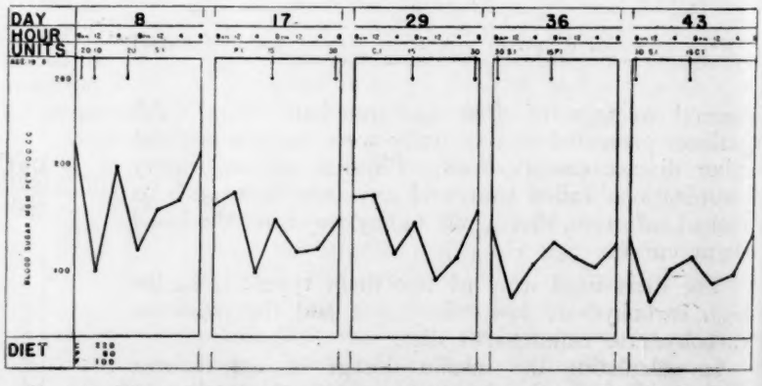

Chart 7.—Effect of standard insulin, protamine insulin and crystalline insulin given individually, as compared with effect of standard insulin as morning injection with protamine insulin and crystalline insulin as the evening dose.

BLOOD SUGAR LEVEL AND INSULIN ACTION

It would seem that the disturbance in the mechanism of the regulation of the blood sugar level in the diabetic patient is dependent on the change in the carbohydrate metabolism primarily in the liver. The blood sugar curve may be altered by the rate of intestinal absorption of dextrose and also by the rate at which the tissues utilize dextrose. The latter change is affected by the amount of insulin in the blood and tissues.

Macleod[8] points out that normally glycogenolysis proceeds more slowly than glycogenesis, whereas in the diabetic patient these processes proceed at an equal rate and hence little glycogen is stored. In the uncontrolled diabetic patient there is a continuous formation of dextrose and a decreased ability to store glycogen in the liver. Insulin injected in the diabetic patient restores the disturbed carbohydrate metabolism to normal by increasing glycogen formation and regulating the production of dextrose in the liver. Insulin injected in the normal subject disturbs the carbohydrate balance by overstimulating some phase in the previously described processes, with a resultant retardation in glycogen formation and storage.

Recent investigations[9] have proved that the liver is more than a storehouse for glycogen; its function in controlling the blood sugar level and its rôle in the production of dextrose need clarification. Hyperglycemia may be due to the rapid release of dextrose from the liver owing to a change in glycogen storage, to dextrose formation or utilization in the liver, or to the rate at which sugar is removed from the blood by the tissues. This imbalance in the glycogen-dextrose metabolism may be restored to normal by the use of insulin. Conversely, hypoglycemia in the diabetic patient would be interpreted as an increased formation of glycogen, a decrease in the rate of production of dextrose in the liver or an increased rate of dextrose utilization by the tissues.

Normally the body responds to hyperinsulinism in diabetic and normal subjects by release of glycogen, which is aided by the increase of secretion of the adrenal glands. In uncontrolled diabetes the glycogen stores of the liver and muscle are markedly depleted, the body being unable to deal with any emergency need for dextrose. The controlled diabetic and the normal subject who have greater stores of glycogen are better

8. Macleod, J. J. R.: Lectures on the Physiology of Glycogen and the Rôle of Insulin and Epinephrine in Carbohydrate Metabolism, Lancet **2**: 1-7 (July 6), 55-60 (July 13), 107-113 (July 20) 1929.

9. Mann, F. C., and Magath, T. B.: Studies in the Physiology of the Liver, Arch. Int. Med. **30**: 73-84 (July) 171-181 (Aug.) 1922; **31**: 797-806 (June) 1923. Best, C. H., and Dale, H.H.: Proc. Roy Soc. London, S. B. **100**: 55, 1926-1927. Best, C. H.; Hoet, J. P., and Marks, J. P., ibid. **100**: 32, 1926-1927. Soskin, Samuel; Allweiss, M. D., and Mirsky, I. A.: Interpretation of Abnormal Dextrose Tolerance Curves Occurring in Toxemia in Terms of Liver Function, Arch. Int. Med. **56**: 927 (Nov.) 1935.

able to cope with this demand. Can this in part be the explanation for the difference in the type and severity of the hypoglycemic reactions observed?

It is agreed that dextrose is essential to the fundamental physiologic metabolism of body cells. When this energy in the form of dextrose is markedly diminished, as in the case of hyperinsulinism in diabetic and normal subjects, certain irritative symptoms occur which are usually associated with low blood sugar levels. However, there have been reports of diabetic patients who had the clinical symptoms of hypoglycemia without the usual accompaniment of a low blood sugar level. Are these clinical observations to be explained on the rate of fall in the blood sugar content, or on the depletion of dextrose from the central nervous system in such a way as to impair the metabolism of the nerve cells regardless of the level of the blood sugar? Since protamine and crystalline insulin are slower in their action, the body is able to adjust itself to this dextrose demand. This is probably done in the uncontrolled diabetic patient by the production of dextrose from the intermediary metabolism of protein and possibly fat. The body cells are supplied dextrose in amounts sufficient to carry out their fundamental basal metabolism and prevent irritative symptoms (hypoglycemia). Could the severe reactions seen after the injection of standard insulin, and the comparatively mild symptoms observed after the injection of protamine or crystalline insulin, even though the blood sugar was markedly lowered, be explained in this way?

COMMENT

All diabetic subjects vary in their response to standard insulin therapy. Some are "insulin sensitive," in that insulin produces a marked effect on the blood sugar level. Others are "insulin resistant," in that insulin has only a slight effect on the blood sugar level. The same phenomenon has been observed with the use of protamine and crystalline insulin and may be the explanation of the varying response of diabetic patients to the types of insulin studies in this report.

Though no attempt was made to determine the minimum dosage of protamine, in some instances the twenty-four hour blood sugar curve could be controlled by the use of protamine insulin twice daily. Crystalline insulin seemed more effective in this regard. However, the best results in the cases of very severe diabetes were obtained with the administration of standard insulin as the morning dose and protamine or crystalline insulin as the evening dose. It is important to reemphasize that when the use of two doses of standard insulin gives the best results the use of protamine or crystalline insulin is of no special value.

The treatment of diabetic coma with protamine or crystalline insulin has thus far been unsatisfactory; standard insulin is to be preferred because of its more rapid action. However, by supplementing standard insulin with protamine or crystalline insulin, a more constant and prolonged effect on the lowering of the blood sugar level and the disappearance of the ketosis was observed.

SUMMARY

This study confirms the observations of previous investigators with regard to the action of protamine insulin. The crystalline insulin compound used in this study has an action similar to protamine insulin. It diminishes the fluctuations in the blood sugar level and also decreases the severity and frequency of the hypoglycemic reactions commonly seen with the use of standard insulin. Crystalline insulin is more rapid in the onset of action and shorter in the duration of its effect on the blood sugar level, in contrast with protamine insulin. Its action on the blood sugar level lasts for a period of from eight to nine hours and returns slowly to its normal level. The number of doses and amount of insulin required to control the blood sugar level is reduced as compared to the use of standard insulin. It is similar to standard insulin in that it is a stable compound and is dispensed in a single solution.

62 Kirby Avenue, West—3825 Brush Street.

Clinical Notes, Suggestions and New Instruments

TULAREMIA AND PREGNANCY: REPORT OF A CASE

DUDLEY P. BOWE, M.D., BALTIMORE, AND DON C. WAKEMAN, M.D., TOPEKA, KAN.

There is an abundance of literature on tularemia, but there has been no careful study of the disease occurring as a complication of pregnancy. Kavanaugh[1] presents an excellent review of 123 cases, stating that "three patients contracted tularemia during pregnancy and were delivered of babies during the height of the infection. In one case labor was premature. The disease did not differ from its usual trend." The following case, occurring in midpregnancy, is presented because of the lack of available data on the disease as a complication of the gravid state, its effect on the maternal organism, and the effect on the fetus:

REPORT OF CASE

Mrs. I. A., a white woman, aged 40, seen in the accident room of the St. Agnes Hospital, Baltimore, Jan. 15, 1935, complained of ulcers on the fingers and a painful swelling on the left arm. She stated that while dressing a rabbit twelve days before (Dec. 24, 1934) she had scratched her left thumb with a splinter of bone. Three days later she noticed a little redness and swelling of the injured thumb. Then a small ulcer developed and in rapid succession there appeared ulcers on the fingers of both hands. At the same time she began having anorexia, fever, frequent chills and sweats and general malaise. December 29 she noticed a painful swelling on the medial surface of the left arm at about the middle third of the humerus.

There was no family history of tuberculosis, diabetes, malignancy or hemorrhagic diseases. The patient's health had always been good except for childhood measles and whooping cough, and there had been nine pregnancies without complications, terminating in full term normal deliveries, all children living and well at the present time. The menses started at the age of 12 and had always been regular and normal except for interruptions during pregnancies. The last menstrual period was in August 1934 and she first felt life early in December. The review of systems revealed nothing except bad teeth, with frequent attacks of toothache.

On physical examination the patient was well nourished, with noticeable pallor of the face and mucous membranes, and a temperature of 100 F. The pupils were regular and equal and reacted to light and in accommodation; the conjunctivae were clear, and the external ocular muscles were normal. The nasal septum was intact and the nares were patent. The hearing was good. The tongue and buccal mucosa were pale; many teeth were discolored and contained cavities, and the gums were retracted. The pharynx was normal. There was no cervical glandular enlargement and the thyroid was not palpable. The chest was symmetrical, expansion was free and equal, resonance, fremitus and breath sounds were normal, and there were no adventitious sounds. The heart was not enlarged or displaced and there were no murmurs. The rhythm was regular, the blood pressure was 135 systolic, 80 diastolic, peripheral vessels

1. Kavanaugh, C. M.: Tularemia: A Consideration of 123 Cases with Autopsy in One, Arch. Int. Med. **55**: 61 (Jan.) 1935.

were soft and the rate was 100 per minute. There was an abdominal mass, apparently the uterus, which was symmetrical, smooth and reaching to the umbilicus, fetal parts could be palpated, and the fetal heart was audible in the left lower quadrant. The liver, kidneys and spleen were not palpable. There were no abnormalities of the spine. Vaginal examination revealed a relaxed perineum with moderate rectocele and cystocele; the cervix was soft in consistency and the uterus enlarged; the adnexa were not palpable. On the palmar surfaces of both thumbs and on the second, third and fourth fingers of the left hand there were pustular ulcers varying in size from 4 mm. to 1 cm. in diameter, with grayish white bases surrounded by elevated reddened areas. On the medial surface of the left arm, at the middle of the humerus, was a firm red, indurated, tender, elevated area 3 cm. wide, with a crusted surface, apparently a subcutaneous nodule. The glands of both axillae were enlarged and tender. When she was admitted to the hospital she gave the impression of tularemia of the ulceroglandular type and pregnancy.

Examination of the blood showed: erythrocytes 3,500,000, white blood cells 5,250 per cubic millimeter, hemoglobin 70 per cent, color index 0.83, polymorphonuclears 66 per cent, lymphocytes 24 per cent, and large monocytes 10 per cent. The blood Wassermann reaction was negative, the urine contained one plus albumin and a few pus cells, and agglutination tests [2] proved the diagnosis of tularemia, with agglutination in a dilution of 1:640.

She remained in the hospital for fourteen days and after the day of admission her temperature was at no time above normal. Because of this, the Foshay serum was not used and treatment consisted of local application of moist heat to the ulcers, with ice bags to the enlarged glands and general nursing care. The fetal heart was observed carefully and remained uneffected. She was sent home after the disappearance of the ulcers, the subcutaneous nodule, and the enlarged axillary glands and returned to the antepartum clinic at intervals for antepartum routine and repeated agglutination tests. The antepartum course was uneventful until April 4, 1935, at which time she complained of painless bleeding for eight hours, passing clots and using a total of fourteen pads. On rectal examination the cervix was felt to be dilated 3 cm. and was very soft, but no placental

TABLE 1.—*Agglutination Titer of Mother's Serum for Bacterium Tularense*

Date	20	40	80	160	320	640	1,280
1/ 8/35	2+	4+	4+	4+	4+	3+	0
1/15/35	2+	4+	4+	4+	4+	4+	0
1/24/35	+	3+	4+	4+	4+	4+	4+
2/ 6/35	3+	4+	4+	4+	4+	4+	+
3/20/35	+	4+	4+	4+	4+	3+	0
4/ 4/35 (delivery)	3+	4+	4+	4+	4+	3+	0

tissue could be palpated. The head was floating. A sterile pelvic examination definitely excluded the possibility of placenta praevia. The bleeding continued for another eight hours without pains. The blood contained 3,180,000 red blood cells, 7,400 white blood cells, 58 per cent hemoglobin, 82 per cent polymorphonuclears, 13 per cent lymphocytes, 5 per cent large monocytes, and 133,500 platelets per cubic millimeter. There was slight anisocytosis, the coagulation time was three minutes (Lee and White), and the bleeding time was one and one-half minutes. Urinalysis was essentially negative. Because of the continued bleeding and anemia it was decided that it would be advisable to induce labor, which was done by artificial rupture of the membranes, slowly draining about 1,000 cc. of amniotic fluid. Two hours later, after deep engagement of the head and a few slight pains, 2 minims (0.12 cc.) of solution of posterior pituitary was administered hypodermically and the child delivered spontaneously after about a dozen pains. The placenta was easily expressed and there was loss of only about 150 cc. postpartum blood.

The male infant breathed spontaneously, weighed 6 pounds 12 ounces (3,060 Gm.) and was apparently mature. The head diameters were: bitemporal 8 cm., biparietal 9 cm., suboccipitobregmatic circumference 33 cm., the occipitofrontal 31.5 cm., and the shoulders 33.4 cm. A thorough examination of the child revealed no abnormalities. The blood counts at birth were 6,000,000 red blood cells, 5,500 white blood cells, 115 per cent hemoglobin, 80 per cent polymorphonuclears, 10 per cent lymphocytes, 2 per cent transitional cells, and 8 per cent myelocytes. In six days there were 4,630,000 red blood cells, 10,350 white blood cells, 100 per cent hemoglobin, 70 per cent polymorphonuclears, 28 per cent lymphocytes and 2 per cent transitional cells. Blood drawn from the infant two hours after birth contained agglutinins for Bacterium tularense in low dilutions. The child was circumcised on the eighth day of life and weighed

TABLE 2.—*Agglutination Titer of Child's Serum for Bacterium Tularense*

Date	20	40	80	160	320	640	1,280
4/ 4/35 (birth)	4+	+	0	0	0	0	..
4/23/35	4+	3+	±	0	0	0	..
5/21/35	4+	3+	±	0	0	0	..

7 pounds 7 ounces (3,374 Gm.) on the tenth day, 11 ounces (313 Gm.) above birth weight after a neonatal loss of 4 ounces (114 Gm.). It was breast fed.

The pathologist's report, by Dr. H. S. Everett, was as follows: The placenta was about 18 by 15 by 4 cm. The cord was centrally inserted. On the maternal surface were numerous opaque white spots from 5 mm. to 1 cm. in diameter, which on section showed white hyalinized nodules, some of which showed hemorrhagic centers.

Microscopic sections showed white infarcts with necrosis and replacement of tissues by fibrin. Villi were well formed and the decidua was partly hyalinized, but there was no evidence of inflammatory reaction. The diagnosis was multiple white infarcts of placenta.

The mother had an uneventful postpartum course, and blood counts on alternate days showed a slight increase in erythrocytes and hemoglobin with liver and iron therapy.

COMMENT

The apparent effects on the course of the pregnancy and parturition were the moderate anemia of the hypochromic type, and uterine bleeding before the onset of labor. The bleeding probably can be attributed to extensive placental infarction, since there was no evidence of a disturbance of blood coagulation. The infant showed no evidence of disease except for the presence of agglutinins in low dilutions (1:80); but this is more than one would expect to be due to the so-called normal agglutinins, which may cause agglutination in dilutions of 1 to 5.[3] This may represent antibody formation by the fetus as the result of bacterial invasion through the placental villi or placental transmission of maternally produced agglutinins. Many of the acute infectious diseases have been demonstrated in the fetus.[4] The increase in the titer of the child's blood indicates that the mother's milk may have also transmitted antibodies, as the child started breast feeding twelve hours after birth. De Lee suggests that this may occur with diphtheria and tetanus antitoxins, and typhoid. In this case the disease was mild in form, the acute stage was of short duration, and the pregnancy was apparently not endangered by the infection.

2 West Read Street—1035 Jackson Street.

2. Agglutination tests were done by the Baltimore City Public Health Laboratory.

3. Park, W. H.; Williams, Anna W., and Krumwiede, Charles: Pathogenic Micro-Organisms, Philadelphia, Lea & Febiger, 1929.

4. De Lee, J. B.: Principles and Practice of Obstetrics, ed. 5, Philadelphia, W. B. Saunders Company, 1930.

An Ample Supply of Vitamin B.—If half of the needed food calories are taken as fruits, vegetables, milk and eggs, and if half of whatever breadstuffs and cereals are used are taken in the whole grain, or "dark," or "unskimmed" forms, there will almost certainly be provided an ample supply of vitamin B—and of many other important nutritional factors as well.—Sherman, H. C.: Food and Health, New York, Macmillan Company, 1934.

Therapeutics

THE THERAPY OF THE COOK COUNTY HOSPITAL

EDITED BY BERNARD FANTUS, M.D.
CHICAGO

NOTE.—*In their elaboration, these articles are submitted to the members of the attending staff of the Cook County Hospital by the director of therapeutics, Dr. Bernard Fantus. The views expressed by various members are incorporated in the final draft for publication. The articles will be continued from time to time in these columns. When completed, the series will be published in book form.*—ED.

THE THERAPY OF PSYCHONEUROSES

IN COLLABORATION WITH S. H. KRAINES, M.D.

"Functional disorders" are just as real disorders as are "organic disorders." Patients with neurotic manifestations are not simply "imagining." The pain that the querulous woman complains of is just as real to her as if it were of organic etiology. The paralysis of the hysterical patient defies voluntary movement as greatly as does that of the hemiplegic individual. These symptoms are not only real to the patient; they hurt and incapacitate him even more than when there is an organic basis, because of the associated mental attitude.

Functional and organic disorders are neither independent, antagonistic nor mutually exclusive of each other. They interact in the most complex patterns. Organic disease is often accompanied by psychoneurotic disturbance; the two may coexist independently of each other, and the latter may eventuate in organic disease. As examples of this correlation may be cited certain forms of hyperthyroidism, so-called pseudo-angina pectoris, "essential" hypertension, and the "gastro-intestinal neuroses" which by indefinable stages merge into peptic ulcer, or colon spasm and mucous colitis. A person with a tendency to diabetes may not develop the clinical disease until after he has gone through an emotional crisis. Many of these conditions can be temporarily relieved by other means; but their obstinate tendency to recurrence can be cured only by discovering and remedying the psychoneurotic disturbance underlying them.

Therefore, successful treatment of all excepting purely physical diseases demands that every patient, whether evidently psychoneurotic or not, be given, in addition to a thorough physical and clinical examination, a social analysis and a personality study: a total analysis.

THE DIAGNOSTIC ANALYSIS

A thorough understanding of the patient's physical condition is, of course, of paramount importance; and it goes without saying that every psychoneurotic individual should have an exceedingly careful physical examination at the beginning of the treatment rather than continuously or frequently repeated. The suggestive influence of a thorough diagnostic "work-up" is inestimable. For, if one can assure the patient after such an ordeal that nothing abnormal has been found, it will go a long way toward relieving his fears with their evil consequences. The objection to frequently repeated reexaminations is that these may carry with them the unfavorable suggestions that the physician is not sure of his ground.

It will help in the understanding of the dynamics of the psychoneuroses to fix our attention on emotion as the motor mechanism: emotion, be it understood, differing from intellectual processes precisely by the degree to which the "intero-effective" division (the autonomic nervous system and the endocrines) enter into the process.

That, in point of fact, many of the symptoms found in psychoneurotic individuals are due to exaggerated activity of the autonomic nervous system and of the endocrines may be illustrated by the dilated pupil, the tendency to sweating (especially of the hands) and the tachycardia occurring in cases that cannot be classified as exophthalmic goiter or by the cases of blood pressure elevation occurring independently of arteriosclerosis and responding so readily to the proper treatment that they cannot well be considered instances of the condition known as essential arterial hypertension. Finally, what better example of this relation could be found than the amenorrhea that occurs in pseudocyesis as well as in women who greatly fear pregnancy?

A large number of the phenomena of psychoneuroses are due to vicious circles set up by these autonomic and endocrine disturbances. The emotionally induced disturbance of secretions and motility of the gastro-intestinal tract reflects itself in the symptoms of anorexia, indigestion, constipation and colon spasm. This disturbance of the digestive system is followed by malnutrition, which in turn increases the weakness and irritability of the nervous system. To the anorexia and constipation we might add insomnia, the third most common presenting symptom of psychoneuroses: a trio which forms a syndrome so characteristic of this kind of disturbance that it may be called the "psychoneurotic triad." The insomnia, due to such emotional disturbances as worry and fear, results in excessive fatigability the next day, which in turn increases the insomnia; for, once fatigue exceeds the physiologic limit, it hinders rather than favors sleep. No less important is the fact that fatigue and weakness breed pessimism, which in turn results in unconquerable worry and fear.

From what has just been said it is obvious that the degree to which emotion enters in the clinical picture must be determined; for, until organic disease results, emotional reactions persist only so long as the emotion persists. Emotion should be visualized as the zone of contact between the "intellect" and the somatic processes with the diencephalon as the "switchboard," the autonomic nervous system as the connecting link, the viscera as the keyboard and the endocrine glands as substations that reinforce and continue the somatic commotion once it is started. Such commotion in turn aggravates the emotional storm so that, unless something is done to allay it, the condition goes from bad to worse. Therapeutically one may break in on the vicious circle at any one of several points; but, unless one succeeds in removing the causative emotion, the results are generally but temporary.

Striking at the root of these disturbances is greatly helped by the understanding that pathogenic emotional reactions are largely due to unresolved conflicts. To discover these unresolved conflicts the patient must be subjected to a personality study.

In the interpretation of the symptoms of psychoneuroses and of suppressed unresolved complexes, the concept of symbolism is of great importance. A symbol is something that stands for a certain idea or group of ideas. Thus the flag is a symbol. The soldier or the patriot does not fight for the bit of bunting carried on the end of a stick. It is the loyalty, the devotion to home, the opinion of his fellow men and many other

factors that are behind the devotion to the symbol, the "flag." It shoud be stressed that symbols have meanings only to the individual person or group; the German flag may arouse no emotion in the French, nor the Japanese flag in the Chinese, except possibly that of antagonism.

The word "symbol" is employed in psychiatry in the same sense. The patient who has a hysterically paralyzed arm is merely using the paralysis of the arm as a symbol for certain ideas. The pains that so many middle-aged neurotic women feel in the abdomen, the heart or the head are in large part symbolic, expressing certain repressed ideas. To the affected individual the "neurotic" pain is real, and the fact that the pain is a symbol carries all the more weight because there is an emotional upset associated with it. If one always keeps in mind that in psychoneurotic persons many symptoms are symbols, an important advance in the understanding of the patient will be made.

In order to find out wherein these repressions lie, one of the most important things is to establish a rapport between the patient and the physician. The patient must have sufficient confidence in the physician to reveal the innermost secrets of his heart; to reveal those very things that he has never told any one else. In psychiatric hospitals, one often comes across patients who, even though devout Catholics, have never told their secret to the priest but who, in the proper setting, unburden themselves to the physician. The exact technic varies greatly with the individual but, generally speaking, if the patient is allowed to talk with but few interruptions, he will bring forth many of his so-called subconscious ideas. A gentle hint dropped here and there which shows that the physician does not become shocked because a person does not subscribe to all the conventional tabus of the day goes a long way toward releasing the inhibitions of the individual to the telling of his story. Sometimes a pointed question brings tears to the patient's eyes, an indication that a sore point has been touched. It is then the physician's duty to proceed with his probing as he would in case of a sinus to discover what is at the bottom of it that keeps it from healing. As the physician palpates an abscess, even though it is painful, to determine the best place for an incision to let out the pus, so must he persevere in following up the painful thoughts to discover the best means of relieving the patient of their baneful effects. If these means are not sufficient, one must resort to the analysis of dreams, to the "free association" method and occasionally to hypnosis. Many patients can be relieved of their long enduring fears by several interviews, but in some cases many months may have to be spent in digging out the repressed ideas.

One illustration may suffice:

A girl complained of terrifying obsessions. For months she dreamed of killing little children. Her fears prevented her from sleeping in a home where a small nephew was present. The obsession grew on her to the point that she thought of suicide. In this case it was found that a few weeks before the onset of her obsessions she had submitted to an abortion. As she was unmarried, there were many complications. She grieved over the "crime of killing an unborn child." She read the newspaper story of a couple killing a child and then the obsessions came on. The obsessive ideas of killing children was her method of symbolizing the killing of her own unborn child. She repressed the memory of the incident, but it lived on in this symbolic form. In two interviews the patient understood the connection and her obsessions disappeared. Since she understood what idea she was trying to express (the reproach over the abortion) she had no need to symbolize it; therefore the disappearance of the obsession. The reproach itself was simply handled.

It is in this field that the psychoanalysts have done their greatest good. They have encouraged the patient to talk and in this manner have brought out the repressions. Unfortunately, psychoanalysts have permitted themselves to raise fanciful superstructures of theory on the basis of these simple facts and to draw wild conclusions from them. In spite of these excrescences of the system, the psychoanalysts at times do get beneficial results. This is due, it seems, mainly to the fact that the patients talk themselves out and learn to appreciate the psychic phenomena at their true worth. The patients also get much benefit from the reassurance that springs from the indomitable and irrepressible faith that the psychoanalyst has in his own treatment. Even if the patients go away with their heads filled with all sorts of unproved speculation and theory, it matters little as long as they have improved.

With these concepts in mind, the treatment of the psychoneurotic patient may possibly be begun, with the feeling that one practices rationally. If one discovers what the repressed ideas are for which the symbols are used and teaches the patient to face the facts, the symbol will no longer be necessary; for, when the individual can be made to understand what the thoughts are that cause him to have symbols, the thoughts can be consciously expressed and consequently there will be no need for their symbolic expression. While matters are not always as simple as this, one not infrequently, at least, secures a therapeutic triumph from the application of these principles.

THE THERAPEUTIC SYNTHESIS

The treatment of psychoneuroses may be resolved into the following indications:

1. Proper care of physical defects.
2. Changing the patient's personality.
3. Lessening environmental strain as much as possible.

1. Remedying physical defects should, of course, be attended to primarily, but only so far as necessary to make the patient more adequate to meet the strains of his life.

(*a*) Surgery: One must be particularly conservative in advising surgery in the psychoneurotic. An operation should be advised only if one feels sure, first, that the patient's physical condition will be so greatly improved by the operation as to give him a new start in life and, secondly, that he will submit to the operation. One occasionally sees patients unimproved by operations because these did not strike the root of the disturbance: individuals who have had thyroidectomies, simply because they were nervous and had a slightly elevated metabolic rate; parous women who have had repairs of lacerated perineum and cervix; and persons who have had nephropexy or appendectomy that did not relieve them for more than a short time, if at all. Such patients may thereafter make it their life's business to discredit surgery and keep others, who need an operation, from securing its benefits. It is also a fact that merely advising operation constitutes a potential psychic trauma. The patient who has been advised to have an operation and rejects it has been harmed by that advice. He is liable to brood over the terrible disease within him and the dreaded operation he does not have the courage to undergo. He may lose sleep, appetite and the joy of living. Such a patient may shun, thereafter, all "regular physicians" in fear that they will

give him the same advice. If he then fortunately happens to be cured by some quackery or other, such a person becomes an ardent propagandist for this form of treatment, which in turn may wreck the chances for cure of many another sick fellow man.

One may be more generous about advising diet or medication than surgery, but these too must be prescribed with discrimination.

(*b*) Diet: Many of these patients are diet cranks and faddists. They crave having special diets prescribed for them; and yet such dieting may be harmful to them by acting as a constant suggestion that they are sick. The dietary of the psychoneurotic should, as far as possible, include everything that goes to make up a normal general diet and the importance of "eating everything" be impressed on the patient. The very multiplicity and bizarrerie of the dietary tabus of these individuals are often directly diagnostic of the psychoneurotic foundation for them. By continually refusing certain articles of food, the patient may have gotten himself into a condition of malnutrition or hypovitaminosis. Indeed, the patient may have to favor the very food that he has been in the habit of avoiding. Thus, some of these individuals have been starving themselves of carbohydrate to acquire the stylish sylph-like shape and they may require an abundance of bread and butter prescribed for them to acquire the euphoric embonpoint. Anemia is common in those who refuse to eat eggs, and these most iron-rich of foods may be the important reconstructive tonic. Allergy must, of course, have been excluded when giving orders for diet.

(*c*) Medicinal treatment directed toward improving the patient's physical condition properly furnishes the medicine so much desired by most of these patients, but one should ever beware of routinistic placeboing. The very fact that a medicine is prescribed serves as a potent suggestion that something physical is wrong. It may "fix" the disease on the patient instead of curing it. Indeed, the psychoneurotic patient is not really cured until he is free from medicine taking.

For the temporary relief of insomnia a sedative may be desirable. For instance, bromide (prescription 1) to lessen excessive nervous irritability. If bromide is not sufficiently powerful, carbromal (prescription 2) may be of value. In patients who have acne, some other sedative may be desirable, e. g., barbital (prescription 3) or phenobarbital (prescription 4). It is best, in general, to give these in subhypnotic divided doses —after meals and at bedtime—rather than to force sleep by means of a large dose of the more powerful hypnotic taken at bedtime only, as there is great danger of narcotic habit formation in these individuals. It is also of great importance for the patient to realize that the sedative is merely an adjunct, to break in on a vicious circle, that it is merely a crutch that must soon be abandoned as otherwise it weakens instead of strengthens. The same principles govern the use of cathartics. (See therapy of Colon Stasis.)

(*d*) Hydrotherapy in the form of prolonged warm baths, which can be taken in any average home, has a very soothing effect. Soaking in warm water (about 92 to 98 F.) for at least an hour will often bring blissful relaxation. Cold showers in the morning are to be recommended at times as a physical stimulant and a training in subjecting oneself to unpleasant experiences for the benefit to be derived in consequence. They also increase resistance to the unfavorable effects of chilling.

2. Changing the patient's personality must be the focal point of therapy of the psychoneuroses. This indication is so difficult to carry out as to make its accomplishment almost a miracle, but the results are no less miraculous.

This change may be accomplished at times by acquainting the patient with his/our basic multiple personality. To simplify the presentation to the patient, it may be presented in somewhat the following manner: "We all have living within us, as our direct and most intimate heritage from our ancestors, a savage, a veritable beast, call it the "id" with Freud or the "anima" with Jung. This is overlaid by a more or less efficient veneer of culture, the result of civilization which makes us socially acceptable and which Jung calls the "persona," the self we want to be and do our best to imagine ourselves to be. The well balanced, happy individual is he whose "anima" and "persona" are in friendly relation with each other, whose persona frankly recog-

PRESCRIPTION 1.—*Bromide*

℞ Potassium bromide ..... 30.00 Gm.
Anise water ..... 30.00 cc.
Syrup of glycyrrhiza.....to make 120.00 cc.
M. Label: Teaspoonful in milk after meals and at bedtime.

PRESCRIPTION 2.—*Carbromal*

℞ 25 carbromal tablets..... 0.30 Gm.
Label: One after meals and at bedtime.

PRESCRIPTION 3.—*Barbital*

℞ Barbital ..... 3.00 Gm.
Divide into 30 capsules.
Label: One after meals and two at bedtime.

PRESCRIPTION 4.—*Phenobarbital*

℞ Phenobarbital ..... 0.80 Gm.
Iso-elixir ..... 100.00 cc.
M. Label: Teaspoonful in a little water after meals and at bedtime.

NOTE.—This is an example of prescribing of a "magistral" formula in contradistinction to ordering of an official or a proprietary formula. The advantage of taking the slight trouble to prescribe medicines as a magistral formula, rather than otherwise, lies in the possibility of readily adjusting the size of the dose to the effect desired. If one prescribes the N. F. Elixir of Phenobarbital or, what is more expensive, a proprietary elixir of this kind, one gets only 0.02 Gm. per 5 cc. teaspoonful. The foregoing prescription carries twice as much. If the patient gets too drowsy from such medication the dose can readily be reduced or it can be increased if he does not get sufficient sedative effect, without having to order two or more teaspoonfuls, which greatly increases the expense of the medicine to the patient. The "iso-elixir" employed in this prescription is now official in the National Formulary. It is a device by which the physician may secure the cooperation of the pharmacist in the adjustment of the proper alcoholic strength of the vehicle. The N. F. VI recognizes two basic elixirs, a Low Alcoholic Elixir, and a High Alcoholic Elixir. These two are miscible with each other in all proportions and the following "note" is appended to the monograph.

"Iso-Alcoholic Elixir (Iso-elixir) is intended to serve as a general vehicle for various medicaments that require solvents of different alcoholic strengths. When, therefore, Iso-Alcoholic Elixir is specified in a prescription, that proportion of its two ingredients is to be used that will produce a perfect solution."

As phenobarbital is alcohol soluble and water insoluble, the pharmacist will employ the High Alcoholic Elixir in preparing this solution.

nizes the insistent demands of self preservation (fear, hunger, acquisitiveness, ambition) and of race preservation (sex, parental love, altruism, patriotism) which strives conscientiously to gratify these in a socially acceptable manner. The individual whose two selves are not on speaking terms with each other is essentially unhappy and dissatisfied." These are the ones whose repressions may result in pathogenic symbolism. By making the patient self tolerant and self understanding, one may be able to effect the necessary personality change.

The frank acceptance of ourselves as we are is therefore an important goal in the treatment. It is an important remedy for an inferiority complex. Thus an individual who has a deformed limb, strabismus, blindness or deafness is liable to develop such a feeling of inferiority because of his handicap. Such a person must be trained to accept his defect as a matter of course and to compensate for his deficiency by excelling in some other direction. These deficiencies constitute no real handicap to the person who is determined to

get on. The inferiority complex resulting from social or sex maladjustment or financial difficulties may be frankly accepted and compensated for in the same way.

Substitution therapy is based on the fact that the desires within us have a drive or energy behind them that continues in spite of the fact that the desires cannot be fulfilled and are liable to result in untoward manifestations unless they are diverted into other channels. Substitution may be employed also in the breaking of bad habits. The inveterate smoker continues to wish to smoke after his pledge to give it up. There is still the energy present urging the person to fulfil his wish. Therefore, to break the habit, one must deal with this drive or energy. One of the best ways is to substitute some other means of utilizing this energy so that it will be less troublesome. Thus, the chewing of gum to the smoker, the providing of active and dressy boy scout group activities to the adolescent gangster, the use of play groups and toys in the case of the infant indulging in masturbation, all represent the substitution of some method of releasing and utilizing the energy otherwise directed into undesirable channels.

To all of us, the presence of some goal in life acts to give zest to living. There are two types of goals: one that is unattainable and ever receding, as exemplified by the admonition to "hitch your wagon to a star." The other type is a series of goals, each of which can be attained relatively easily and in a reasonably short time: steps, as it were, in the attainment of a greater goal. Surmounting each such step gives satisfaction and it is the satisfaction of attainment that is the important thing.

Sex hygiene is vital. The presence of erotic disturbances in so many patients warrants the formulation of the sexual problem to each individual. Patients are often helped by removal of the feeling of guilt over their natural sex urge or over undesirable results to which it has driven them. Once a mistake has been made, it may be condoned if the socially more acceptable and hygienically safer form of life is adopted for the future. Much of the difficulty and infelicity of married life is due to remediable sexual maladjustment and much good can often be accomplished by a frank discussion of the difficulties.

Proper habit formation is one of the great functions of hygiene, habits not only in the daily way of doing things but in emotional response as well. Children may develop habits of emotion instability that are often carried through life. Whereas it is true that the fundamental constitution of the individual so often determines what type of affect is present, nevertheless it is also true that these fundamental emotional drives can be greatly ameliorated and changed. Persons who are subject to violent outbursts of temper may be helped by pointing out to them methods of control. Thus, the patient may be urged the next time he becomes excited to turn around and walk into another room until his anger blows over. The fact is stressed that he is too excitable and that he can in time, by continued practice, learn to "thicken his skin" so that he is not so easily aroused. When this is combined with readjustment of the personality in other ways, surprising results can often be obtained.

Socialization is of extreme importance to many patients, who, sitting alone in their homes, brooding over their aches and pains and fears, miss the wholesome companionship of the "other fellow." Many examples can be cited of "neurotic women" whose aches and pains were greatly helped by becoming active members of benevolent or reform organizations. They did not have time to think of their own ailments, in the interest of what others were doing.

Occupation Therapy: A program of daily activities should be outlined for the patient with his cooperation and in consultation with his desires. The day should be so arranged that there is something being done all the time, the purpose being to allow little opportunity for brooding, and to instil new and stimulating ideas: for some, walking, for others listening to the radio, or seeing the movies, or doing some special work. The type of program depends entirely on the individual. It is at this point that hobbies have a significant rôle. Often the daily work of the individual is a compulsory matter, his life's vocation being merely a necessary evil by means of which he can subsist. To such persons the development of avocations, of hobbies, brings great relief. The doing of something other than one's work, the getting of pleasure out of accomplishing things that do not have to be done, are of great value in relieving the tedium of life and making the patient happy. Right here it might be well to note that concrete realities are the best type of hobbies. By this it is meant that individuals who tend to be day dreamers should not develop the reading of books as their hobby. This is too abstract; they need much more concrete and real things. The development of a carpentry shop where they can make and feel and see their own creations, the collection of stamps, photography, the care of a garden or the raising of pets is better for this purpose. "Fancy work" has a curative tendency for many a neurotic woman.

Diversion and fun are the only way in which we can secure a vacation from our accustomed thoughts during waking hours. The more the thoughts are inclined to be morbid, the more are we in need of such diversion. Movies, the theater, concerts, parties and picnics, travel, all have a therapeutic value, most especially for those who have been largely denied them. Of the requirements for a proper mode of living—a sufficient amount of work, a sufficient amount of rest, a sufficient amount of food and a sufficient amount of fun—the last is not the least.

Often it is necessary to desensitize a person to some painful memory. The case of the girl who developed obsessive thoughts as a result of the "painful memory" of the abortion illustrates the need of making this "memory" less painful. This is carried out almost in the same fashion as desensitization for an allergen. The topic of such emotion is discussed a little at a time and at frequent intervals, until finally the patient is no longer so sensitive about it. It should be noted that it is not the obsession or the "peculiar idea" that is discussed but the etiologic factor, the "painful memory." When, on the other hand, a patient borders on the psychotic and presents fixed delusions, he should never be argued with as to his delusion. Controversy too often tends to fix and harden ideas of fancy that will disappear if not touched on.

Suggestion, or the implanting of a dominant idea in the mind of another individual without process of reasoning or persuasion, is ever present in all forms of therapeutic endeavor. The very fact that a patient submits to any kind of treatment with faith that it will help him carries with it a potent suggestion that it will do so. This is indirect suggestion, in contradistinction to direct suggestion, which is exerted when one

expresses in words the idea one wishes to implant in the mind of the other individual. Thus, the statement "I will cure you" is a direct suggestion, the curative potency of which is in proportion to the faith the patient has in the one who makes the statement. Suggestion is the chief stock in trade of the quack, who promises a cure regardless of his ability to perform it and by that act alone often cures those curable by suggestion. Scientific physicians, on the other hand, do not resort to this potent measure often because they are harassed by honest doubts as to the completeness of their understanding of the case. While we cannot afford to sacrifice honesty—the distinguishing feature between the quack and the physician — we should employ such direct suggestion as "You will get well" whenever we have no reasonable doubt of the truth of this statement. We often neglect to do so because it seems so obvious to us. It may not be to the patient.

Suggestion by itself is capable of removing all those symptoms due to suggestion, but it is merely of symptomatic value. It does not cure the psychoneurosis itself. Suggestion is therefore of much less importance than training the patient to understand himself and to deal effectively with his problems. It is, nevertheless, true that the credulous are influenced more readily by suggestion than by persuasion; also, that suggestion is of importance in every case. The very manner, words and look of the physician have a suggestive influence of profound importance. The physician who can make his patient feel that he is his friend and can carry the conviction that he will do his best to help has a healing potency within himself. The physician to whom the patient can tell his troubles with certainty of sympathy and understanding and the expectancy of relief can give much help. It should be the aim of every physician to treat his patient so that he feels better for having had the consultation. Some patients feel better even the moment they lay eyes on the physician.

In many cases in which the individual is of inferior intelligence or the time available is short, hypnosis is of value. It must, however, be realized that hypnosis (a form of suggestion) is similar to medication in that it is only a temporary measure, that lasting results are not likely to be obtained unless a personality readjustment is accomplished. One finds many hysterical persons cleared of their symptoms by hypnosis, only to return at some future time with a different type of symptom, brought on by the same factors that caused the first symptom.

3. Lessening environmental stress is often possible by adjustments in the patient's surroundings. Such adjustment will go a long way toward helping in stabilization of the patient. Often one can accomplish much by treatment of the relative (husband, wife or parent) who is the irritating factor. For instance, a husband too "busy" to give his wife the companionship she craves may be made to see the error of his ways. A patient who developed a marked change in personality following a head trauma, with symptoms of great sexual drive and of explosive irritability, was nicely handled by making the wife more understanding, sympathetic and accommodating.

Change of environment may generally be secured most easily by a "vacation," and the physician who does not have it among his materia therapeutica misses a powerful weapon in his armamentarium. By advising a temporary change of environment one can often discover to what extent the accustomed environment is detrimental to the patient.

A changed environment may do more than anything else toward promptly relieving the symptoms of maladjustment. It is often surprising to see how a child that has been living in a "temperamental home" and is afflicted with temper tantrums with hypochondriacal aches or pains or with enuresis, will improve in a relatively short period in more stable surroundings. For many a "nervous" child, its mother—herself "nervous" —is its worst enemy. Adults, being merely "children grown up," react in the same way.

Whenever an individual improves on going away from "home" and relapses on returning to it, his habitual surroundings are thereby revealed as pathogenic and the exact nature of the pathogen may then become discoverable. The patient may have to be permanently removed from the unfavorable influence, unless it is possible, by methods previously described, to immunize him to its evil effects.

Securing an abundance of rest as well as a sufficient amount of work is a sine qua non with psychoneurotic patients. Excessive fatigue as well as excessive leisure are toxic factors that must be resolutely eliminated, for fatigue breeds pessimism and it may be pessimism that makes the conflict unresolvable, the situation unbearable. An after dinner nap is often a better sedative than any medicine that may be prescribed. A partial rest cure for a month or more should be insisted on for patients who are much underweight as well as for those who, on account of overwork with tension and insomnia, are in danger of the narcotic habit. Just as excessive fatigue begets restlessness and insomnia, so rest begets rest in these individuals. For example, a partial rest cure for an overworked housewife requires hiring of help so that the amount of work required of the individual may be sufficiently reduced to permit increasing the amount of time spent in rest and relaxation; e. g., breakfast in bed and one or two hours' rest afterward, an after dinner nap of an hour or two, and going to bed right after supper. As the patient improves, the time in bed is progressively diminished.

Physicians must, however, beware of diagnosticating overfatigue and prescribing a rest cure merely because the patient declares himself tired. The work may be so uncongenial as to "make the patient tired" without actually overfatiguing him. Or the individual may be of the self-indulgent type and suffer from a premature sense of fatigue. Such patients need to be strongly encouraged to continue at their occupation until they can exchange it for more congenial work, and it is desirable to discover what the patient "would love to do" and try to point out ways and means of arriving at a practical solution of his problem. For instance, a person who had started on the study of medicine and who, because of family demands, has to make his living by "piece work" tailoring may have pointed out to him that his fatigue is really due to his dissatisfaction because of frustrated ambition. This individual's ambition may be guided into directions that are realizable and that will better satisfy his ego, as salesmanship or craftsmanship, most especially in a field akin to his ambition, such as the surgical instrument business.

Of course, a person who has been indolent and who, owing to lack of outside interests, has become largely

preoccupied with self is in need of the opposite kind of treatment, which has been pointed out under "occupation therapy."

SUMMARY

Psychoneuroses are due to the patient's inability to meet the situation of his life in an adequate manner. This inability is due to excess of external stress or a defect in the patient's constitution or, most commonly, the combination of the two. Treatment is therefore directed at (1) relieving the stress as much as possible and (2) remedying the patient's deficiency. The temporary removal of the symptoms of psychoneuroses is relatively easy. Permanent cure can be accomplished only by a change in the patient's personality by means of training to more adequate mental attitudes and habits.

The only excuse for inflicting this lengthy article on a literature-overburdened medical profession is that psychoneuroses are curable much more often than they are cured and that every doctor, no matter what his special line of work, has these cases and either helps or harms them in accordance with his understanding of their needs.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS. HOWARD A. CARTER, Secretary.

REPORT OF THE COMMITTEE ON THE PRESENT STATUS OF PHYSICAL THERAPY

The original report of the Committee was written ten years ago,[1] at the time of the organization of the Council on Physical Therapy of the American Medical Association. At that time there were certain conditions in the realm of physical therapy that threatened its ethical standing with the profession as a whole. Many new pieces of apparatus had been introduced and many overenthusiastic statements had been made and published by those who were becoming addicted to an untried machine therapy. The original report sounded a warning concerning the abuses of physical therapy and then presented the Council's suggestions for an ideal relationship between physical therapy and other branches of medicine. The Council's predictions have been so nearly achieved and the status of physical therapy in the field of medicine today is so much improved and so firmly established on a sound basis that the Council now feels that a new report on the present status of physical therapy is necessary.

"Physical therapy" is the term employed to define the treatment of disease by various physical means. It comprises the use of heat, massage, exercise, light, water, electricity, and mechanical and other physical agents.

The use of these physical agents has become thoroughly established as an integral part of medical practice. However, knowledge concerning the exact physiologic effects, therapeutic usefulness and technic of application of many of them is still limited. Physical agents should not be used by the physician unless he is thoroughly familiar with the source of the physical energy he is using and with the effects which it will produce. The use of these therapeutic devices empirically, simply to produce psychologic effects, is to be strongly condemned.

As in its previous report, the Committee desires to warn the profession as a whole against the acceptance of enthusiastic statements by manufacturers' agents—salesmen absolutely untrained in medical science. While the Committee feels that, for the most part, the sales agents of manufacturers of physical therapeutic equipment are no less trained and no more overenthusiastic than the representatives of many drug and surgical supply houses, nevertheless physicians are warned particularly against the high pressure type of salesman of physical therapy equipment who extols his device in terms of its earning ability. Choice of such devices should be based solely on the decision as to their therapeutic efficacy.

In its previous report the Committee pointed out that, although physical therapy came into its legitimate place in medicine during the World War, it is one of the most ancient methods of therapy. At the time of this previous report, now several years ago, the Committee stated that physical therapy was gradually taking its place with the usual medical and surgical procedures. Today we may say that it has assumed its correct position in ethical medical practice and has become a definite part of modern medicine. The Committee desires to reiterate, however, that unless we guard against bad habits in its usage, against allowing it to replace careful diagnostic measures followed by well defined but less spectacular methods of treatment, and, especially, unless we guard against its insidious tendency to make its master an easy living, physical therapy may lead into dishonest practice or quackery.

The solution to the development of legitimate physical therapeutic practice has been found in the organization of the numerous departments of physical therapy in the hospitals of this country. Just as the physician, while he may do some of the simpler laboratory tests in his office, uses the clinical laboratory for more difficult tests, so does he utilize the hospital's physical therapy department for many of the more elaborate physical therapeutic methods of treating disease, even though he may desire to use some of the simpler physical therapy measures in his own office.

Among the physical measures that have been found both by clinical experience and by laboratory research to have certain therapeutic value when appropriately prescribed may be included: (1) heat, in the form either of hot packs, hot water bottles, electric pads, radiant heat lamps, diathermy and short wave diathermy, hot baths, hot compresses, hot sprays and a number of combinations of electrical, radiant and hydrotherapeutic measures for producing heat, or of artificial fever produced by hot air, hot water, high frequency currents and other physical means; (2) massage, such as stroking, kneading, percussion, friction and vibration, as well as stretching, pulling and corrective movements; (3) therapeutic exercises, including passive or relaxed movement, assistive movement, active movement, active resistive movement, corrective and therapeutic games and training in correct body mechanics; (4) hydrotherapy, including thermal packs, douches, sprays, baths, contrast baths, whirlpool and other special baths, under water exercise tanks and therapeutic pools; (5) radiant energy,

1. Report of Committee on Present Status of Physical Therapy, J. A. M. A. 87: 1302 (Oct. 16) 1926.

either natural such as in heliotherapy or sunlight therapy, or artificial, such as is produced by air and water cooled mercury arc lamps, carbon arc lamps, radiant heat lamps, infra-red generators and other special devices for the production of various forms of artificial irradiation including radium and roentgen rays; (6) electricity in the form of galvanic, faradic and sinusoidal currents and high frequency currents (conventional and short wave diathermy); (7) mechanical measures utilizing pressure and suction machines and mechanical hydrotherapeutic and electrical devices, and (8) occupational therapy, both functional and nonfunctional forms, giving exercise by both diversional and purposeful types of work.

In its previous report the Committee stated that physical therapy was in a transitional stage and that it was "still violently condemned in toto by some physicians." Probably the best indication of the progress of physical therapy within the past few years lies in the fact that such a statement can no longer apply. There are few, if any, physicians who condemn physical therapy in toto in these days. The physician should no more condemn physical therapy in toto than he should condemn internal medicine, surgery, orthopedics or roentgenology in toto. While physical therapy is still in a transitional stage as far as its establishment as a recognized field of regular medical practice is concerned, nevertheless this transition has progressed within the past five years toward the point of complete consummation.

The Committee previously suggested that physical therapy should be considered as an adjunct to other forms of treatment, both medical and surgical. The Committee now wishes to suggest that, whereas physical therapy is a smaller and less developed field than either medicine or surgery, and whereas frequently the use of physical measures is merely an adjunct to other forms of treatment, it is possible to conceive of instances in which the use of some physical measure will be the primary method of treatment and medical agents or surgical procedures may be the adjunct. In other words, physical measures should be used only when and as indicated either primarily or secondarily in relation to other methods of treatment.

The previous report also dealt rather extensively with the use of physical therapy by charlatans and quacks. Our present report need not take so much cognizance of this angle. Nevertheless there are charlatans who practice in all fields of medicine and the idea should be abandoned that scientific physical therapy bears a stronger relationship to quackery than do other branches of medicine. The Committee feels that it must still sound a warning against overenthusiasm and exaggerated claims for the value of newly developed physical methods of treatment of disease. The present hyperenthusiasm concerning short wave diathermy and concerning positive and negative pressure machines is a case in point. At the present moment there is a trend toward overenthusiasm for the use of short wave diathermy and there is a similar wave of hyperenthusiasm for the use of positive and negative pressure machines in the treatment of circulatory diseases. Each of these measures appears to have a definite, though limited, field of usefulness, and each is being threatened with extinction because of the danger of a reaction against unwarranted claims. The Committee desires to sound a plea for carefully controlled clinical studies on the use of such devices before results are published in the literature. Ethical manufacturers, it is hoped, will heed this warning and develop their devices on the substantial ground of scientific fact rather than haste to compete with a myriad of fly-by-night concerns.

At the time of the organization of the Council, overenthusiasm on the part of certain physicians concerning ultraviolet therapy, combined with the high pressure salesmanship of certain manufacturers, had literally swamped physicians' offices, hospitals and many private homes with all kinds of ultraviolet lamps, some effective and some worthless. It took the Council at least four years to clear up the ultraviolet situation. Finally, by rejecting many of these ultraviolet lamps and by listing the few diseases really benefited by ultraviolet, and by developing standards for advertising ultraviolet lights, this form of physical therapy was brought into its present ethical position. We must avoid overenthusiasm for all new physical therapy apparatus, lest we have a duplication of the ultraviolet fiasco.

In its previous report the Committee pointed out that "The Council on Physical Therapy feels that the following points must receive the most careful consideration of the medical profession: (1) Physics, physiology and biochemistry must be called on to dispel the empiricism of the past and to demonstrate scientifically the value of various physical agencies." The present committee is aware that there has been a great deal of work done in these fields during the past five years which has aided in dispelling the empiricism of the past but is still of the opinion that this point should be stressed. "(2) Physical therapy must be recognized as a definite part of medicine, to be practiced and controlled by graduate physicians. It should be used only as one of the triad of medicine, surgery and physical therapy. It should be prescribed only after careful physical and laboratory examinations of the patient have been made. It should never be prescribed except by a physician thoroughly trained in the use of physical agencies."

The present committee desires to elaborate this statement by suggesting that, according to present day conceptions, rather than occupying one corner of a triad, physical therapy is situated at one corner of a many sided geometrical figure bearing a relationship to all the medical specialties both major and minor which appear at the other corners of this figure. Further, the very fact that it does bear a relationship to so many of the medical specialties emphasizes its value to medicine as a whole. According to our present ideas the statement that adequate physical and laboratory examinations should be made prior to the administration of this form of therapy should be accepted by every modern physician and applies equally to all phases of medicine. Emphasis has been previously made that physicians should be thoroughly trained in the use of physical agencies. There is need, however, for further education in this field, not alone through the medium of the undergraduate medical schools, but also through postgraduate education at medical centers and through various medical societies and medical journals.

In its previous report the Committee stated: "The treatment of disease, whether by drugs, surgery or

physical agents, belongs solely in the realm of medicine. A physician would not refer a patient to a nonmedically trained technician for treatment through drugs or surgery, yet many physicians refer patients to technicians—masseurs, gymnasts or nurses who have not received training in physical therapy, or even to members of various cults for physical therapeutic treatment. . . . Therefore physical therapy must be recognized as a component part of medicine and patients requiring this type of treatment should be referred only to physicians trained in this specialty. In this way the use of these methods by charlatans will be largely eliminated."

The present committee desires to elaborate on this portion of the previous report by commenting that there are ethical technicians in the field who work in various hospitals and institutional departments under the direction of physicians, and occasionally as technical assistants to physicians specializing in the field. The Committee feels that just as ethical nurses work under the supervision of physicians and as laboratory technicians work under the supervision of a physician in charge of the laboratory, so well trained physical therapy technicians thoroughly imbued with medical ethics are logically of value in conducting the mechanical details of the administration of physical therapy under the supervision of a physician.

At this point the Committee desires to urge that all hospital departments of physical therapy be under the direction of a physician, and that the frequent practice of placing a medically untrained technician in charge of such departments be abandoned. The Committee realizes that the supply of well trained physicians in this field is limited, but it nevertheless feels that the rule should be adhered to in principle and that proper steps should be taken to provide the necessary graduate education in physical therapy for physicians. The technicians to serve under these physicians should be either graduate nurses or graduates of recognized schools of physical education, and in either case they should have had an additional year's training in a recognized school of physical therapy. The Council on Medical Education and Hospitals has prepared a list of approved schools for physical therapy technicians. The need for such technicians is manifest and their training should be encouraged, provided it is understood that they are to work under direct medical supervision.

The present committee concurs fully with the last portion of the previous report: "(3) Since physical therapy is a definite part of medicine, every medical school should give a thorough training in this subject. The paucity of postgraduate and undergraduate instruction in physical measures in our medical schools has placed the profession at a disadvantage. Many attempts have been made to remedy this situation. A subject as intricate as physical therapy requires more study than the acceptance of a salesman's assertion that the snapping of a switch or the pressing of a button will definitely assuage any pathologic condition.

"The making of physical therapists by courses of one or two weeks often reeking with commercialism must be condemned. The three to six weeks courses sponsored by reputable medical schools are frankly makeshifts but do serve to show the breadth of the subject; at least they effect the realization that such a period suffices only for establishing the purely mechanical details of technic and the broader physiologic groundwork on which, aided by his medical knowledge and common sense, one may attempt to erect a physical therapeutic superstructure. The remedy is adequate instruction to undergraduates in the medical schools. Courses starting with biophysics should be given in the last three years. In the postgraduate schools more intensive and prolonged courses should be offered. Medical societies should invite physicians specializing in physical measures to give sane, scientific courses in physical therapy to the members. A fair proportion of the scientific programs of medical societies should be assigned for discussion of physical measures of treatment."

In commenting on this section of the previous report the present committee desires to point out that, although the activities of the Council have practically wiped out commercial courses and that there has been considerable increase in the amount of postgraduate and undergraduate instruction in physical measures, there is still great need for further development along these lines. The Committee on Education of the Council on Physical Therapy has aided considerably in the postgraduate instruction of physicians through the medium of various medical societies by providing a group of well trained speakers who are available to the chairman of any medical society's program committee. It has further increased the knowledge of the general practitioner by providing a series of motion pictures on various phases of physical therapy. These are available without charge for use by any ethical group of physicians. The fact that physical therapy is receiving more attention in the medical literature is obvious to any one who glances through the current journals or the *Cumulative Index Medicus* and compares these with a journal or a volume of the *Index* published five years ago. For example, in the April 4, 1936, issue of THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION the words "physical therapy" appear in articles, announcements, committee reports, advertisements and so on no less than seventy-nine times.

In its previous report the Committee announced that the Council would "attempt to keep the profession informed of the extensions and limitations of therapeutic value of old and new methods and of the efficacy and danger of apparatus offered to the profession and the public by the manufacturers." The present committee desires to announce that the second edition of the Handbook of Physical Therapy, a collection of approved articles on various phases of physical therapy, previously published under the auspices of the Council, is now available through the American Medical Association. It also wishes to bring to the attention of readers a booklet listing the apparatus accepted by the Council on Physical Therapy. This will serve as a guide to the practitioner in the purchase of physical therapy equipment and may be obtained by writing the Secretary of the Council on Physical Therapy, 535 North Dearborn Street, Chicago.

The Committee feels that since its previous report the status of physical therapy in its relation to general medicine has improved considerably, that there is a better understanding of the field as a whole by physicians at large, and that the activities of the Council on Physical Therapy in its attempts to disseminate reliable information on this subject have been well rewarded. There is still a need, however, for fuller cooperation between investigators and phy-

sicians engaged in clinical fields, on the one hand, and, on the other, the small group of physicians trained in physical therapy who are attempting to place this branch of medicine on a more scientific basis.

SANBORN MOTOR-GRAFIC MODEL E-I-S METABOLISM TESTER ACCEPTABLE

Manufacturer: Sanborn Company, Cambridge, Mass.

The Sanborn Motor-Grafic Model E-I-S is a closed circuit motor blower, spirometer type of metabolimeter which weighs 67 pounds. This weight includes the water necessary for the mechanism, weighing 3 pounds, the table with oxygen tank, weighing 29 pounds, and the metabolism unit and all other accessories which go with the unit, weighing 35 pounds. It is 58 cm. high, 22 cm. wide and 40 cm. long at the base. It has an extended size when in use of 86 cm. high, 116 cm. long and 22 cm. wide. The entire machine is mounted on a sturdy base which can be conveniently leveled by two thumb screws at the motor end of the machine.

Oxygen to be breathed is contained in a spirometer 163 cm. in diameter supported in a water seal in the usual way. Soda lime used for absorbing the carbon dioxide from the patient's expired air is in a removable container within the spirometer.

A movable, upright support carries a solid wheel having two grooves of different diameters. One groove has a diameter of 11.2 cm. and carries a chain by which the spirometer bell is suspended in the water jacket. The other groove is 8.2 cm. in diameter and has attached a chain which lifts the marking carriage, to which the stylus or pen is attached. This solid wheel has an inner spring which counterbalances the weight of the spirometer bell and the marking carriage. The difference in diameter of the two wheels allows the spirometer bell to move 1.366 cm. for every centimeter movement of the writing point. This reduction in movement allows the use of a smaller kymograph drum and paper of convenient letter size.

Two types of markers are provided and are interchangeable, one a metal stylus and the other a simple capillary type marking pen with a reservoir containing enough ink for several tests. Ordinary letter size paper may be used with the ink pen, but the metal stylus writes on special stylographic drum paper 8½ by 11 inches in size, convenient for filing.

The kymograph drum is held in place and turned by a spindle projecting from a telechron electric clock mechanism in the base of the machine and is held at the top by a centering set pin which can be displaced to remove the drum. The paper is held in position by small clasps at both ends of the kymograph drum. The same switch is used for starting the clock and motor blower.

A metal encased "red" alcohol thermometer is situated openly on the base of the machine in such a position that the bulb of the thermometer is in the flow of air going from the spirometer chamber to the patient. The use of colored alcohol makes the thermometer easy to read.

The blower for circulating the oxygen is mounted in a metal container, which with the motor forms a single unit. This is fastened solidly to a valve mechanism which is an integral part of the base, with openings direct to the spirometer chamber and to the outside air.

Two rubber tubes of 2 cm. inside diameter lead from the valve openings to the patient. These tubes are held by a metal support of great flexibility, allowing them to be used in any desired position. A quarter turn of a small lever is sufficient to switch the respiration of the patient from the oxygen in the spirometer to the outside air.

When the machine is in use the patient breathes from a closed circuit in which the oxygen from the spirometer is circulated by the motor blower. This blower is placed in the return circuit and therefore draws the respired gas from the patient and drives it through the soda lime back into the spirometer. The negative pressure at the mouthpiece is less than 2 mm. of water and the pressure at the outlet of the pump is slightly higher.

An ordinary small sized oxygen tank, an aneroid barometer, three rubber mouthpieces of the usual type, and the customary nose clip are provided with the apparatus.

Accessory rubber valves of the usual design are furnished with the machine to be used in case electric power is not available for driving the motor. These are enclosed in aluminum tubes, which can be inserted in the circuit between the spirometer outlets and the mouthpiece.

Tests of Mechanical Efficiency.—The time clock mechanism turns the kymograph drum once in eight minutes. This is accurate to within two seconds and well within that necessary for clinical accuracy.

The spirometer bell volume was tested by the removal of definite amounts of air from the bell. The machine was found to be 99.8 per cent accurate, which is a variation of no clinical importance over such a short test period.

The machine was tested for leakage over several days' time with 1.75 Kg. weight added to the bell and with 1.75 Kg. lift on the spirometer bell. No leakage was found in any parts either with the motor running or stopped.

It was found that a pressure equivalent to a water column 3 mm. at the top to 15 mm. at the bottom was needed to move the spirometer bell from the highest to the lowest positions respectively.

The aneroid barometer furnished with the apparatus was compared with a standard mercury barometer and found accurate within the needed limits.

The apparatus was tested with the valves in place and found free from leakage. With a water manometer placed in the circuit it was found that a pressure change equivalent to 22 mm. of water was required to operate the valves, while a change in pressure of 1.5 mm. on each respiration was recorded without the valves and with the motor running.

Sanborn Motor-Grafic Model E-I-S Metabolism Tester

The patient has a slight negative pressure to breathe against with the motor running, while with the motor stopped and the valves in place there is a positive pressure against the lungs.

Basal Metabolism Determinations.—This machine was tested by parallel basal metabolism determinations on patients in comparison with a standard machine of proved reliability. The results of a long series of such tests show an agreement of 1.7 per cent between these two machines.

Table and Computations.—The tables and charts used in the calculations have been checked and found to be accurate. The method of calculation is simple and time saving and the computation of the basal metabolic rate by these tables gives the same values as those computed by the Roth Metabolimetric Chart when the volume of oxygen is computed as 20.867 cc. per millimeter drop of the bell.

Comparative Efficiency of the Valves and Motor Blower.—As a result of the tests made with the valves and motor blower on the same individual under identical conditions as has been noted, further investigations of the comparative efficiency of the valves and motor blower on this machine were made.

By disconnecting the motor and inserting valves in the tubes connecting the patient with the spirometer chamber, the machine may be used without the mechanical circulation of oxygen.

The ease of operation as far as the patient is concerned when the valves are used compares favorably with other valve type machines. This is shown by the statements of the patients who used the machines in successive tests and by the comparative volumes of oxygen used during the tests. Patients also stated that the motor blower "seemed to facilitate respiration" when compared to the Sanborn valve mechanism. The work caused by the valves was found to average 540 gram centimeters for each full respiratory movement of one centimeter by the spirometer bell.

In view of the favorable report, the Council on Physical Therapy voted to include the Sanborn Motor-Grafic Model E-I-S Metabolism Tester in its list of accepted devices.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, AUGUST 22, 1936

RECENT INVESTIGATIONS ON STREPTOCOCCI

The relation of the ubiquitous streptococcus to specific disease processes is one of the most difficult problems in bacteriologic and immunologic research. The essential problem is how to differentiate the pathogenic from the nonpathogenic forms. Various methods have been studied with this aim in view, but thus far no thoroughly adequate method has been described.

A further attempt to advance the solution has recently been reported in a series of studies by Chapman and his co-workers.[1] The strains of streptococci used in their investigations were isolated from suspected foci of infection of patients with chronic diseases. After purified substrains were obtained, certain in vitro tests were applied. One of the earliest tests was the so-called bactericidin reaction, which was an attempt to correlate the resistance of streptococci to the "bactericidal" action of fresh, defibrinated guinea-pig blood. In the investigations reported other substances, notably sodium carbonate, sodium bicarbonate, phenol, basic fuchsin, hexylresorcinol and merthiolate, were used in place of guinea-pig blood. Resistance to these chemicals was in many instances similar to that obtained with the blood. Because many of the strains of streptococci examined exhibited maximum resistance to the bicarbonate and hexylresorcinol solutions, attempts were made to measure higher degrees of resistance by including additional tests with stronger solutions of the same chemicals and with longer periods of exposure. A series of 1,898 strains was tested by exposing each strain to 0.3 per cent sodium bicarbonate for one hour and to 0.5 per cent sodium bicarbonate for two hours and testing for viability both immediately after mixing and again after exposure. Each strain was tested also by exposing it to 1:200,000 hexylresorcinol for one hour and to 1:125,000 hexylresorcinol for two hours and similarly testing for viability. In 83.2 per cent of the strains the results were exactly the same with the two chemicals. In a further attempt to correlate this resistance factor with certain pathogenic factors, rabbits were inoculated intravenously with strains of streptococci of differing powers of chemical resistance. A series of rabbits inoculated intravenously with streptococci that reacted negatively to the "bactericidin," hexylresorcinol and bicarbonate tests showed no apparent effects from the inoculation until a dose of at least 15 cc. of a culture had been given them. Those rabbits inoculated with chemically nonresistant strains died when the dose reached from 3.5 to 6 cc.

These results suggest that the types of streptococci studied possessed varying amounts of nonspecific resistance factor, which could be determined by exposure for adequate periods and in appropriate dilutions to a number of different chemical substances. Probably the nonspecific resistance factor may be measured quantitatively by exposure of the strains to certain chemicals. Furthermore, the experiments indicated that strains reacting positively to in vitro tests were able to kill rabbits in much smaller doses than strains reacting negatively to the tests.

A different method of attack has recently been reported by Longcope.[2] He examined for antistreptolysin 1,716 samples of serum from fifty-five supposedly normal persons and 516 patients suffering from a variety of disorders. From the results of these tests it seems justifiable to conclude, according to Longcope, that the upper limit of antistreptolysin in the serum from the normal adult is 100 units. The lower level in this series of normal adults was 12.5 units. It was also observed that the antistreptolysin varied little from month to month in the same individual. It appeared to be unaffected by severe colds and minor infections not due to hemolytic streptococci. Even a comparatively insignificant infection caused by hemolytic streptococci, however, might result in a significant rise in the antistreptolysin within eighteen days of the infection. In acute infections the number of slightly elevated antistreptolysin titers was somewhat greater than those obtained from normal patients. It is impossible as yet, however, to determine whether infecting organisms such as the meningococcus or pneumococcus are related to these rises. Several forms of hemolytic streptococcus infections also were studied. During the first few weeks of erysipelas there was usually a rapid increase in the antistreptolysin content of the serum. In scarlet fever, though the number of observations was scanty, there was a similar tendency manifested toward an increase in the antistreptolysin titer of the serum in the third week of the disease. High titers

1. Chapman, G. H., and Rawls, W. B.: Studies of Streptococci: I. Qualitative Differences in Resistance to Various Agents, J. Bact. **31**: 323 (April) 1936. Chapman, G. H., and Curcio, Lillian: II. Quantitative Differences in Resistance to Sodium Bicarbonate and Hexylresorcinol, ibid., p. 333. Chapman, G. H.; Berens, Conrad, and Nilson, Edith L.: III. Preliminary Attempts to Correlate Resistance to Chemicals, with Pathogenic Effects, ibid., p. 339.

2. Longcope, Warfield: Studies of the Variations in the Antistreptolysin Titer of the Blood Serum from Patients with Hemorrhagic Nephritis: I. Control Observations on Healthy Individuals and Patients Suffering from Diseases Other than Streptococcal Infections, J. Clin. Investigation **15**: 269 (May) 1936; II. Observations on Patients Suffering from Streptococcal Infections, Rheumatic Fever and Acute and Chronic Hemorrhagic Nephritis, ibid., p. 277.

were also obtained regularly in one form of acute hemorrhagic nephritis but not in another form of the disease. Some correlation could be noted between the antistreptolysin curves and the course of the disease in patients with acute rheumatic fever and acute hemorrhagic nephritis. This correlation, however, was not close. Longcope advances the highly important comment that the high titers observed during the course of acute rheumatic fever and acute hemorrhagic nephritis indicate only that there has been a recent infection due to hemolytic streptococci and cannot be used as evidence that these diseases are caused by hemolytic streptococci. Finally, his observations indicate that there appears to be a difference of reactivity among persons suffering from different forms of streptococcic infection. This leads to variation in the production of antistreptolysin. Patients suffering from acute rheumatic fever and acute hemorrhagic nephritis appear to be especially prone to the formation of antistreptolysin in comparatively large quantities.

The investigations described indicate graphically the progress that has been made in the study of bacteria and the reaction which they produce since the time when practically all such research was based on morphology and cultural characteristics. Although the complicated problem of the streptococcus in disease is not yet solved, the advance in experimental technic foreshadows a hopeful outcome. Extension of observations along such lines as those carried out by Chapman and Longcope and further refinements in technic should eventually lead to clearer differentiation of this complicated group of organisms.

THE ANTISCORBUTIC FACTOR IN COW'S MILK

Because cow's milk has been relied on as the chief if not the only source of food for infants, and for many children and adults in ill health, the nutritive value of its many known constituents has received wide attention. Twenty-four years ago Frölich [1] demonstrated that cow's milk possesses antiscorbutic properties and his studies stimulated efforts to evaluate the amount of vitamin C contained in milk. Reports of such quantitative investigations have continued unabated since Chick, Hume and Skelton's [2] first indication that a daily consumption of from 100 to 150 cc. of fresh cow's milk is needed to protect the guinea-pig from scurvy. In contrast to these and other similar observations there are reports which have claimed for milk a much higher antiscorbutic potency than was found by the English group. Wide variations in vitamin C values are due to a number of influences, some beyond the control of the consumer and some which he can regulate provided he has interest and knowledge. Partial or complete loss of cevitamic acid (vitamin C) in milk is due chiefly, if not entirely, to oxidation, which may be induced by standing, by exposure to heat, light and air, and by the presence of metallic catalysts, especially copper. Nevertheless the experiments of King and Waugh [3] have shown that the dairy industry may now produce pasteurized milk as rich in cevitamic acid as was the same milk in the raw state before pasteurization.

Milk as it is received by a dairy may vary in its content of cevitamic acid, owing to differences in the breeds of cows constituting the milking herds, their stages of lactation, and the rations which they are fed. Rasmussen and his co-workers [4] determined the vitamin C in the fresh milk of cows "receiving a typical dairy ration which contained weighed quantities of green feed." They found that the average content of this factor in milk from Ayrshire, Guernsey and Jersey breeds is about the same but that milk from brown Swiss cows is richer in cevitamic acid and has an average value 48 per cent above that for Holstein cows, whose milk has the least potency. In view of the wide variations found in the milk from cows of the same breed, the suggestion was made that the stage of lactation may be a factor causing larger variations in the cevitamic acid content of milk than breed differences. Furthermore, the cow's ration may be an influence in determining the antiscorbutic potency of freshly produced milk. A recent report indicates that summer milk has more vitamin C than milk produced in winter,[5] but other investigations have shown that a lowered content of cevitamic acid in winter milk is not necessary, for the various rations studied had no significant influence on the amount of this factor present.[6]

Fortunately, the consumer can be assured that the vitamin C content of raw milk supplied by a modern dairy can be practically constant throughout the year. In the interests of high milk production rations fed can be uniform and of good nutritive quality at all times. Pasteurized milk likewise can supply not only uniform amounts but as much of this essential vitamin as fresh milk.[3] Hence the amount of cevitamic acid which the consumer may obtain from milk will depend in large measure on the methods of handling this food between the time of its delivery and its consumption. Serious losses in the antiscorbutic factor may occur in the home or hospital as the result of such simple procedures as mixing or decanting. A significant decrease in vitamin C has been reported [5] in milk that stood from six to eight hours in the dark, even though it was cold. Reheating milk also lowers its potency; a loss of 20 per cent was observed after five minutes of light boiling;

1. Frölich, T.: Experimentelle Untersuchungen über den infantilen Skorbut, Ztschr. f. Hyg. u. Infektionskr. **72**: 155, 1912.
2. Chick, Harriet; Hume, E. M., and Skelton, R. F.: The Antiscorbutic Value of Cow's Milk, Biochem. J. **12**: 131, 1918.
3. King, C. G., and Waugh, W. A.: The Effect of Pasteurization upon the Vitamin C Content of Milk, J. Dairy Sc. **17**: 489, 1934.
4. Rasmussen, Russel; Guerrant, N. B.; Shaw, A. O.; Welch, R. C., and Bechdel, S. I.: The Effects of Breed Characteristics and Stages of Lactation on the Vitamin C (Ascorbic Acid) Content of Cow's Milk, J. Nutrition **11**: 425 (May) 1936.
5. Wachholder, K.: Die Versorgung des Säuglings mit Vitamin C, Klin. Wchnschr. **15**: 593 (April 25) 1936.
6. Riddell, W. H.; Whitnah, C. H.; Hughes, J. S., and Lienhardt, H. F.: Influence of the Ration on the Vitamin C Content of Milk, J. Nutrition **11**: 47 (Jan.) 1936.

but in heating milk an aluminum pan was as satisfactory as glass in conserving the cevitamic acid present. Nevertheless, the ordinary handling of milk in the home or in the hospital will inevitably cause some deterioration in its vitamin C potency.

The inherent nutritional virtues of milk have been vastly improved by modern contributions to the hygienic production and handling of this valuable food. The recent biochemical studies point the way to still further conservation of the nutritive values of milk.

CARBON TETRACHLORIDE IN INDUSTRY

The applications of chemistry to industry are prolific in creating new problems for physicians and pathologists. Among the earliest of the diseases of chemical origin were those due to lead and to carbon monoxide. Among the substances of wide use and high industrial value, carbon tetrachloride takes a foremost place. This liquid has properties of peculiar advantage. It is not only entirely noncombustible but also an efficient means of extinguishing fire. As a solvent and extractor of fatty substances, it has almost entirely displaced the highly inflammable naphtha and related liquids that formerly caused frequent fires with much loss of property and life in the cleaning industry and in homes. Against this advantage must be set the fact that carbon tetrachloride is a powerful and highly toxic anesthetic, its after-effects resembling those of delayed poisoning by chloroform. Carbon tetrachloride and chloroform differ in fact only in that the former is CCl_4 and the latter $CHCl_3$. Like chloroform also carbon tetrachloride, in the presence of a flame or heated metal, forms phosgene, one of the principal toxic gases used in war.

Sanitary experts have for some years past increasingly emphasized the hazard to health and life involved in the use of carbon tetrachloride without measures to prevent inhalation of its vapor. The extensive industries manufacturing and using carbon tetrachloride were for a time resentful of what they regarded as attacks.[1] On this account Surgeon General H. S. Cumming three years ago invited representatives of the industry to meet those sanitarians who had been particularly outspoken in a conference in which the two sides were enabled to present their views. As a result of that conference the industries concerned themselves organized and gave the requisite funds to a committee appointed to study the problem and to report on practical measures for its solution. This committee then engaged Drs. H. F. Smyth, H. F. Smyth Jr. and C. P. Carpenter of Philadelphia to make a thorough experimental investigation and to report their results as a basis for regulations to control the health hazard in all branches of the industries using carbon tetrachloride.

1. Hamilton, Alice: Industrial Poisons in the United States, New York, Macmillian Company, 1925, pp. 442-443; Industrial Toxicology, New York and London, Harper & Brothers, 1934, pp. 9 and 224. Henderson, Yandell, and Haggard, H. W.: Noxious Gases and the Principles of Respiration Influencing Their Action, New York, Chemical Catalog Company, Inc., 1927, pp. 136-137.

The report of Drs. Smyth and Carpenter was completed a few months ago and its principal results and recommendations have now been published.[2] It shows that no hazard to health is induced by concentrations of carbon tetrachloride in the air breathed that do not rise above 100 parts per million, or 0.01 per cent. Now the industry has imposed on its members the requirement that in no plant shall the concentration of carbon tetrachloride to which employees are exposed be allowed to rise above this amount. This is certainly a method of solving a serious health problem which deserves approval by sanitarians and imitation by other industries having similar problems.

Current Comment

VITAMIN PROMOTION

For many years pseudoscientists have projected the idea of a perfect food substance that would contain all the essentials necessary for the diet in a single tablet to be swallowed by the human being three times a day and to obviate the necessity for meals of ordinary foods. The idea is of course preposterous, unless the human body changes its anatomy in the near future. The stomach and the intestines require something more to work on than an ounce of pills three times a day. If the atrophy of disuse is not to affect the musculature, the requirement for bulk must be considered in the preparation of the perfect food. Moreover, the sense of taste and all the factors concerned in appetite constitute an important consideration in the selection of food. This, however, has not prevented manufacturers from offering to the public substances alleged to be almost perfect as foods. A new product is a so-called Vitamin Energy Bar, which is claimed to be the equivalent of three loaves of bread in fat, one pound of butter in protein, two and one-half pounds of cheese in carbohydrates, two bunches of celery in calories, two oranges in calcium, one large egg in phosphorus, and four quarts of buttermilk in iron. Somehow the promoter overlooked vitamins F and H as well as zinc, manganese and copper. This is a fine example of the fallacy of equivalents as a standard of measurement. Instead of giving the equivalent in fat of the butter, the bread is chosen as the example; instead of giving the equivalent of the milk for calcium, oranges are chosen for that comparison. And the calories are said to equal those of two bunches of celery. Whoever picked celery for calories! Actually the "Vitamin Energy Bar" seems to provide one-half ounce of fat, one-sixth ounce of protein and less than 2 ounces of carbohydrate, with traces of calcium, phosphorus and iron. Those are the facts—but they do not sound nearly as impressive as the great quantities of food represented by the advertiser's equivalents. If however you really want to see if one "Vitamin Energy Bar" is the equivalent of all that food, eat the "energy bar" at one meal and all the food at another. Your digestive system will solve the problem for you—and not mathematically!

2. Smyth, H. F.; Smyth, H. F., Jr., and Carpenter, C. P.: The Chronic Toxicity of Carbon Tetrachloride: Animal Exposures and Field Studies, J. Indust. Hyg. **18**: 277 (May) 1936.

Medical Economics

STATE EDUCATION AND STATE MEDICINE

The state educates us, why should it not heal us? It protects us against invasion, why not against disease? So runs one of the most frequent arguments for state medicine.

Perhaps the state system of education failed in its effort to teach logic to those who reason thus. Analogy is proverbially a dangerous foundation for a logical premise. Disease and education differ widely even though many exposed to both fail to get either.

For the special comparison, differences are greater than resemblances. Every one needs all the education he can get, especially if he is to be of value to a democratic state. In childhood and youth we all need much the same sort of education and even as adults there are so many who wish to learn the same things that books, lectures, classes and radio can be used effectively for mass educational treatment. It is possible to make fairly accurate diagnoses of ignorance and of progress through educational treatment by mass examinations, although even in education there are some doubts as to the accuracy and efficiency of such mass methods.

Ignorance does not come on suddenly and create an emergency demand for education. The need for education varies slightly with times and conditions. The positive benefits of education are not confined to the individual. Society obtains a direct return for its investment in the education of its members.

Health and ignorance are alike in only a few features and within those limits the state is already active. The value of that activity depends largely on how closely it is limited to the fields for which it is fitted. Whatever can be done for the people as a whole, the state can usually do with fair success. Where individuals must be distinguished and given widely different and suitable treatment, the mass action of government is seldom successful.

The state can establish quarantine to protect the whole people against the invasion of disease, collect and tabulate vital statistics of the whole population, assist in health education, urge widespread general immunization and rally the forces to meet the mass attacks of epidemics. Within those limits and such others as have the same qualities, the medical profession has always aided and encouraged state activity.

When individuals are to be aided in recovery from illness, the analogy with education becomes a contrast. It is seldom that two persons need exactly the same treatment. Medical service is seldom as helpful when given to groups or classes as when administered to individuals. The degree of disease and progress of recovery vary widely, are hard to measure and cannot be standardized in grades.

Medical service does not fit into time tables. Its value depends largely on a personal relation between two individuals —the sick person and his physician. It must be given in widely varying intervals to each individual, and its value depends in a high degree on the way it is suited to each personal situation.

The reasoning that would have medicine follow the educational pattern is further weakened by an increasing apprehension that standardization in education has not been wholly successful. Forcing teachers and pupils into a common mold is held to be destructive of both individual and social values, to injure those of exceptional ability and thereby to deprive the nation of greatly needed intelligent, independent leadership.

Political influence and pressure groups have worked much harm to education, although it is much better suited than medical service to resist or endure such influences. It is charged that supervision by lay boards, ignorant of pedagogic methods, has hindered professional progress and tended to cripple the freedom of thought and investigation that is of fundamental importance in education. Again such influences would be much more destructive in the medical field.

In spite of the fact that education is freely offered by the state to every one and that over 26,000,000 pupils were in elementary and high schools in 1931-1932, there were at the same time over 2,700,000 in private and parochial schools. In other words, 10 per cent of the population refused to accept the free standardized system offered and preferred to pay for the kind of education they considered more suitable to their individual desires.

The total cost of public day schools amounted to over $2,160,000,000 and the expenditures in universities and colleges was over $600,000,000 more. It was impossible even with these great expenditures and the enormous extent of standardization to provide employment for those who had been accepted as teachers, so that in 1930 there were nearly 12,000 teachers, in the words of the census, "out of a job, able to work and looking for a job." The effect of the depression was widespread, causing reduction in educational services and failure to pay those teachers who still remained at their work.

To the extent that education does resemble medical service, it seems to have suffered under state administration. Only where the contrast is greatest has it been successful. If a comparison is to be made, it would seem to be a warning rather than as an example.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ALABAMA

A Large Malaria Prevention Project.—A total area of between 20,000 and 30,000 acres in Greene County will be drained in a WPA project to reduce the prevalence of malaria in the state, newspapers report. In addition, about 2,000 acres of stagnant pools will be emptied. This program, the largest of its kind in the state, is said to be the only one in which the county has given financial assistance. Greene County officials have appropriated $5,099 to supplement WPA funds of $41,643.

ARKANSAS

Personal.—Dr. Thomas M. Fly, Hot Springs National Park, has been appointed health officer of Little Rock to succeed Dr. Verdo T. Webb, who resigned to devote his time to private practice.——Dr. Thomas T. Ross, Arkadelphia, health officer of Clark County, has been appointed assistant director of the state department of health, in charge of the division of maternal and child health. He has been succeeded as health officer by Dr. Jesse K. Grace, Danville. Present plans call for the organization of a district health department, composed of Clark, Nevada and Hempstead counties, newspapers reported. ——Dr. Silas C. Fulmer, professor of medicine, University of Arkansas School of Medicine, Little Rock, has been appointed assistant dean in the medical school.

CALIFORNIA

Society News.—Dr. Newton G. Evans was chosen president of the Los Angeles Cancer Society at its first regular meeting, June 17. The next meeting of the society will be September 3.

Plague-Infected Squirrels.—One squirrel received at the laboratory of the state department of health, July 7, from a point five miles south of Pine Creek, Modoc County, was found to be plague-infected, according to *Public Health Reports*. Evidence of plague was found in three collections of fleas received at the laboratory, June 25, from places within a few miles of Davis Creek, Modoc County. Plague was also found in five squirrels received at the laboratory July 2 from various places in Santa Cruz County.

COLORADO

Society News.—A joint meeting of the Medical Society of the City and County of Denver and the Denver Radiological Club was addressed August 5 by Drs. John D. Camp, Rochester, Minn., on "Osteoporosis and Its Importance in Medical Diagnosis," and James M. Martin, Dallas, Texas, on "The Physician's Responsibility to the Cancer Patient."——At a meeting of the Delta County Medical Society, June 26, Dr. John V. Ambler, Denver, discussed treatment of common infections of the skin.

The Colorado Medical Foundation.—At a meeting, July 8, the board of trustees of the Colorado State Medical Society approved the establishment of the Colorado Medical Foundation. The plan to organize the foundation was instituted at the 1935 meeting of the state medical society, when authority for its creation was granted to the board of trustees by the house of delegates. Its objective is to serve as a sound financial background for the membership of the state medical society and its income "shall be used exclusively for charitable or educational purposes and the necessary expenses incident thereto." Although the fund is now small, *Colorado Medicine* points out, it is provided that until the foundation reaches the sum of $100,000, not more than 10 per cent of its net annual income may be turned over to the treasurer of the state medical society for expenditure. After it reaches $100,000 and until it reaches $1,000,000, up to 50 per cent of the net annual income may be utilized. After it reaches the million dollar figure, the portion of the income to be used, and the amount to be left in the fund to accumulate, will be determined by the officers and trustees of the society. The principal of the fund will never be expended. Any donor to the fund, however, may stipulate how his contribution may be expended and whether the principal and income shall be used in full or in part.

CONNECTICUT

Accidental Deaths.—Accidents accounted for 1,255 of 17,355 deaths reported in Connecticut in 1935. Of these, 491 were attributed to motor vehicles. In this group of accidents, collision with pedestrians accounted for 274 deaths. Of the 358 accidental deaths occurring in public places, drowning was responsible for the greatest number, with a total of eighty-nine. In fatal accidents in the home, falls led the mortality with a total of 235, accounting for 67 per cent of the total in this group. Deaths due to occupation made up only 4.4 per cent of the total number, according to the state department of health, while accidents in the home accounted for 27.9 per cent and accidental deaths in public places for 28.5. With a rate of 39.2 per cent of all deaths, automobile accidents contributed more deaths than any other classification.

DISTRICT OF COLUMBIA

Personal.—Clarence J. West, Ph.D., for several years director of research information service for the National Research Council, has been appointed technical editor of the Institute of Paper Chemistry affiliated with Lawrence College, Appleton, Wis.

University News.—Dr. Henry Lauran Darner has been promoted to clinical professor of obstetrics and gynecology at George Washington University School of Medicine, Washington, and Dr. John Edward Lind to clinical professor of psychiatry.

FLORIDA

Appointments to Health Positions.—The following appointments as district health officers have recently been announced in the newspapers: Drs. James W. McMurray, with headquarters in Marianna; Rayburn N. Joyner, Jacksonville, and Joseph S. Spoto, Ocala. Dr. Thomas E. Morgan, Jacksonville, has been appointed in charge of the newly organized health unit in Pinellas County, with headquarters in Clearwater, and Dr. Charles A. O'Quinn, Perry, appointed in Taylor County.

GEORGIA

Society News.—Dr. James C. Metts was elected president of the First District Medical Society, July 15, and Dr. Charles Usher, Savannah, was reelected secretary. The spring meeting of the society will be held in March.——At a meeting of the Fulton County Medical Society in Atlanta, August 6, Dr. George Hugh Cochran discussed "Brain Injuries" and Dr. James Gaston Gay, "Present Status of Surgery of the Thyroid in Children."

ILLINOIS

Division of Industrial Hygiene Created.—A division of industrial hygiene in the state department of health, Springfield, has been created to study health hazards under which employees work and make recommendations for preventive measures. Headquarters for the new division will be at the University of Illinois College of Medicine, Chicago, with Dr. Milton H. Kronenberg in charge.

Convalescent Polio Blood Serum Needed.—The state health department needs convalescent blood serum to replenish the supply on hand for the treatment of new patients with infantile paralysis. Healthy persons in Springfield and vicinity who have recovered from infantile paralysis during the last ten years and who wish to contribute blood for this purpose will be compensated. Additional information may be obtained from the state health department at Springfield.

New Building for Trachoma Clinic.—A new two story building to house the trachoma clinic in Jonesboro was dedicated, July 15, under the auspices of the Union County Board. Speakers included Miss Audrey Hayden, secretary of the Illinois Society for Prevention of Blindness. The building was constructed with materials salvaged from abandoned county buildings; it was financed with WPA funds. Opened in 1934 in the Union County courthouse, the clinic is one of several in southern Illinois where trachoma is prevalent. More than 1,700 positive trachoma patients and 350 suspects attend the five southern clinics, which operate three days each week in Herrin, Harrisburg, Shawneetown, Vienna and Jonesboro, newspapers reported.

Chicago

An Eighty-Five Tops the Golf Tournament.—Dr. Frank S. Needham, Oak Park, won the VanDerslice Cup at the annual golf tournament of the Chicago Medical Society August 12 at Olylmpia Fields with a gross score of 85. First prize for low net score for officers and councilors went to Dr. Richard F. Greening; for branch presidents and secretaries, Dr. Anders J. Weigen. First low gross score for members was made by Dr. John P. Mulcahy; first low net by Dr. Guy V. Pontius; first high gross by Dr. John J. Gill. About 250 physicians and their friends participated in the tournament.

Dr. Visscher Goes to Minnesota.—Dr. Maurice B. Visscher, since 1931 professor of physiology, University of Illinois College of Medicine, has resigned to become head of the department of physiology and physiologic chemistry, University of Minnesota School of Medicine, Minneapolis, effective September 1. His successor at Illinois has not been announced. Dr. Visscher was a member of the teaching faculty at Minnesota from 1922 to 1925, when he took the degree of doctor of philosophy. He received the medical degree at Minnesota in 1931. He was a fellow of the National Research Council at University College, London, 1925-1926, after which he went to the University of Chicago. He served as associate professor of physiology at the University of Tennessee School of Medicine from 1927 to 1929 and of physiology and pharmacology, University of Southern California, 1929 to 1931, when he was appointed at Illinois.

INDIANA

Personal.—Dr. Thurman B. Rice, Indianapolis, has resigned as assistant director of the state department of health and has been succeeded by W. T. Frazier, Bluffton, executive engineer of the department; it is the first time a layman has held the position. Dr. Rice will continue to act as director of the health and physical education department, a correlating department of the health and education departments created under the social security act. He will continue as editor of the department's bulletin.——Dr. Maurice Joseph Barry was reelected president of the Indianapolis Board of Health, and Drs. Clarke Rogers and Herman G. Morgan were reelected vice president and secretary respectively; Dr. Morgan will also continue as city health officer.

Dr. Wishard Retires.—Dr. William N. Wishard, professor and chairman of the department of genito-urinary surgery, Indiana University School of Medicine, Indianapolis, has retired, newspapers report. He has held this position at Indiana since 1887. He occupied a similar position at Purdue School of Medicine, retaining the title when the medical schools of the state merged in 1908 under the name Indiana University School of Medicine. Dr. Wishard, who is 84 years of age, in 1876 graduated from Miami Medical College, which later became the department of medicine of the University of Cincinnati College of Medicine. He has been a member of his state and county medical societies since 1875 and served as president of the Marion County Medical Society in 1894. In 1895 he was president of the Mississippi Valley Medical Association, in 1905 president of the American Urological Association, and in 1918-1919 first vice president of the American Medical Association and member of its House of Delegates from 1902 to 1912. He was president of the Indiana State Medical Association in 1898. He served in various capacities in the state association, holding the chairmanship of the council from 1903 to 1913. He was chairman of the committee on public policy and legislation of the state society from 1896 to 1922 and a member of the state board of health from 1900 to 1911, being

president in the latter year. Dr. Henry O. Mertz, clinical professor of genito-urinary surgery, has been named to succeed Dr. Wishard. He is 52 years old and a graduate of Indiana, class of 1908.

IOWA

Twin Lakes District Meeting.—Dr. Thomas L. Vineyard, Dow City, was chosen president of the Twin Lakes District Medical Society at the fourteenth annual meeting in Rockwell City, June 11, and Dr. Paul W. Van Metre was reelected secretary. Crawford County was added to the society this year, making twelve counties in the group: Calhoun, Carroll, Greene, Hamilton, Humboldt, Ida, Kossuth, Pocahontas, Sac, Webster and Wright.

Personal.—Dr. Tom B. Throckmorton, Des Moines, was elected grand master of the Iowa Masonic Grand Lodge in Davenport, June 10-11.——Dr. Regnar M. Sorensen, Drakesville, has been appointed health officer of the newly opened health unit in Washington County.——Dr. Paul Stephen, Cedar Rapids, has been appointed assistant in the division of communicable diseases and assistant epidemiologist, effective July 1. The appointment was made possible by social security funds. ——Dr. Arthur C. Schach, Burlington, has been appointed director of the reorganized health unit for Des Moines County, with headquarters in Burlington, effective June 1.

Society News.—A program of antepartum service has been instituted in Washington County under the auspices of the state board of health and the county medical society; it is said to be the first undertaking of its type in rural Iowa.——Social security funds were used to finance a rural immunization program for children in Polk County, June 22-27; no charge was made regardless of the parent's ability to pay.——Speakers before the Austin Flint-Cedar Valley Medical Society in Waverly, June 11, included Drs. Lee Forrest Hill, Des Moines, on "Serotherapy in Infectious Diseases" and Edwin J. Kepler, Rochester, Minn., "Modern Treatment of Diabetes, Including the Use of Insulin Protaminate." Dr. William J. McGrath, Elkader, was elected president.——Dr. Edward B. Hoeven, Ottumwa, was chosen president of the Des Moines Valley Medical Association at the sixty-third annual meeting, June 16.

LOUISIANA

Health at New Orleans.—Telegraphic reports to the U. S. Department of Commerce from eighty-six cities with a total population of 37 million for the week ended August 8 indicated that the highest mortality rate (19.9) appeared for New Orleans and the rate for the group of cities as a whole was 9.7. The mortality rate for New Orleans for the corresponding week of 1935 was 17.8 and for the group of cities 9.5. The annual rate for the eighty-six cities was 12.7 for the thirty-two weeks of 1936 as against a rate of 11.8 for the corresponding period of 1935. Caution should be used in the interpretation of these weekly figures, as they fluctuate widely. The fact that a city is a hospital center for a large area outside the city limits or that it has a large Negro population may tend to increase the death rate.

MASSACHUSETTS

Appointments to State Medical Board.—Dr. Charles P. Sylvester, who was reappointed chairman of the Massachusetts State Board of Registration in Medicine, July 17, has resigned on account of ill health. Dr. Royal Phillips Watkins, Worcester, has been named to fill the unexpired term. Dr. Watkins was a member of the board from 1922 until the recent meeting, when he was succeeded by Dr. Harry L. Stevens, New Bedford. Under suspension of the rules the council approved the nomination of Dr. Watkins to fill Dr. Sylvester's unexpired term, according to the *New England Journal of Medicine*.

Springfield's First Physician.—A wreath was placed on the grave of Dr. John E. Leonard, Springfield's first doctor, during the recent celebration of Springfield's three hundredth anniversary. Accompanied by Dr. Henry E. Sigerist, William H. Welch professor of the history of medicine, Johns Hopkins University School of Medicine, Baltimore, members of the Hampden District Medical Society visited Dr. Leonard's grave in the Agawam Village Cemetery, where a wreath was placed. Dr. Leonard died in 1744, aged 69. A wreath was also placed on the grave of Dr. Lambert Cooper, who died in 1755, as a tribute to Dr. William H. Chapin, Springfield, who is Dr. Cooper's great-great-grandson. In the evening Dr. Sigerist addressed a public meeting on "The History of the Development of Medicine, 1636-1936."

MICHIGAN

Society News.—Dr. William J. Butler, Grand Rapids, addressed the Eaton County Medical Society in Charlotte, June 25, on "Office Management of Genito-Urinary Disorders."——At a meeting of the Oakland County Medical Society in the St. Joseph Mercy Hospital, Pontiac, June 16, Dr. Irving W. Potter, Buffalo, spoke on "Elective Version and Extraction."

Payment for Medical Fees Authorized.—A monthly sum of $50,000 is now available to pay physicians' fees for the treatment of crippled and afflicted children, as a result of action taken by the governor and the augmented state administrative board, July 22. All counties in the state have established a county medical society public relations committee in accordance with an agreement between the Michigan State Medical Society, the Michigan Probate Judges Association and the Michigan Hospital Association. Under this system afflicted and crippled children of the state will be examined and their economic status determined. Those able to pay will be "filtered" back to their family physician; physicians caring for children unable to pay will be paid with funds from the appropriation now made available.

MINNESOTA

Northern Minnesota Meeting.—The Northern Minnesota Medical Association will hold its annual meeting at Fergus Falls, August 31-September 1, when the following program will be presented:

Dr. Harold S. Diehl, Minneapolis, The Medical School and the Practicing Physician.
Dr. James L. McLeod, Grand Rapids, Acute Abdominal Symptoms Complicating Diagnosis.
Dr. William G. Strobel, Duluth, Pilonidal Sinus and Its Treatment.
Dr. Virgil J. Schwartz, Minneapolis, Dyspnea and Dysphagia of Unusual Origin.
Dr. Owen H. Wangensteen, Minneapolis, Significance of Anatomical Features of the Vermiform Appendix in the Genesis of Acute Appendicitis.
Dr. Edward B. Tuohy, Rochester, Recent Developments in Anesthesia.
Dr. Newton D. Smith, Rochester, Hemorrhoidectomy: A Plastic Operation.
Dr. Manley F. Fellows, Duluth, Eyeground Examinations as an Aid to Prognosis in General Medicine.
Drs. Clement I. Krantz and Thomas O. Young, Duluth, Chronic Hyperthyroidism.
Dr. William A. Stafne, Moorhead, Recent Advances in Diabetes Mellitus.
Dr. Moses Barron, Minneapolis, Some Fevers Difficult of Diagnosis.
Dr. Charles S. Raadquist, Hibbing, Silicosis on the Iron Ranges.
Dr. Thomas A. Peppard, Minneapolis, Symptomatology of the Various Leukemic States.
Dr. Maurice A. Shillington, St. Paul, Interpretation of Heart Murmurs.
Dr. William F. Mercil, Crookston, Missed Abortion.

Dr. William L. Patterson and the staff of the Fergus Falls State Hospital will conduct a clinic on neuropsychiatry. At the banquet Dr. Olaf J. Hagen, Moorhead, will be toastmaster and William L. Strunk, Sc.D., professor of biology and chemistry, Luther College, Decorah, Iowa, guest speaker, on "The Vanishing Hosts"; Dr. Arthur N. Collins, Duluth, will deliver his presidential address.

MISSOURI

Personal.—Dr. Warren H. Cole, who has resigned as assistant professor of clinical surgery, Washington University School of Medicine, St. Louis, to become professor and head of the department of surgery, University of Illinois College of Medicine, Chicago, was honored by friends and colleagues at a farewell dinner, July 10. Speakers included Drs. Evarts A. Graham, James B. Costen and Park J. White Jr., all of St. Louis.——Dr. Charles A. George has been appointed commissioner of health of Springfield.

NEW JERSEY

Death from Spotted Fever.—A death from Rocky Mountain spotted fever was reported at Avalon July 18, according to the New York *Times*. The man became ill July 7. It was said that only eight cases have been reported in New Jersey in the past seven years.

NEW YORK

Chautauqua Medical Meeting.—The fifth annual interstate medical meeting at Chautauqua under the auspices of the Chautauqua County Medical Society was held July 22. Speakers were Drs. Byron D. Bowen, Buffalo, on "Diabetes and the Use of a New Insulin"; James G. Carr, Chicago, "The Heart"; William D. Johnson, Batavia, "Surgery Now and Then," and Harry E. Kleinschmidt, New York, "Progress in the Control of Tuberculosis."

Personal.—Dr. Edward S. Godfrey Jr., state health commissioner, and Dr. Simon Flexner, New York, have been named members of an unofficial commission appointed by Governor Lehman to study Bang's disease and mastitis.——Drs. Harry L. Chant, Hornell, and Edwin L. Crosby Jr., Schenectady, have been provisionally appointed assistant district health officers on the staff of the state department of health, assigned to the Hornell and Albany districts respectively. Dr. Gordon R. Gray, Gouverneur, has been appointed assistant epidemiologist with headquarters at Amsterdam.——Dr. James F. Michel, Farmingdale, celebrated his completion of fifty years of medical practice recently. Dr. Michel is village health officer and president of the First National Bank of Farmingdale.——Henry D. Dakin, Sc.D., Scarborough-on-Hudson, received the honorary degree of doctor of laws at the annual degree ceremony of the University of Leeds, England, June 29. Dr. Dakin took his doctor of science degree from Leeds in 1907.

State Tuberculosis Hospital Dedicated.—The second of three new state hospitals for care of the tuberculous, the Homer Folks Tuberculosis Hospital at Oneonta, was dedicated July 9 with Governor Lehman the chief speaker at the ceremony. Other speakers were Drs. Thomas Parran Jr., surgeon general, U. S. Public Health Service, former state health commissioner; Augustus J. Hambrook, Troy, chairman of the public relations committee, Medical Society of the State of New York, and Robert E. Plunkett, Albany, general superintendent of state tuberculosis hospitals, and Mr. Folks. Dr. Edward S. Godfrey, Albany, state health commissioner, presided. Mr. Folks, for whom the hospital was named by special act of the last legislature, has been secretary of the State Charities Aid Association since 1893, with the exception of the two years 1902-1904, and member of the Public Health Council since its organization in 1913. He has also been president of the National Tuberculosis Association. The state legislature in 1931 authorized the establishment of three sanatoriums to serve rural districts. The first to be opened was the Hermann M. Biggs Memorial Hospital at Ithaca and the third will be at Mount Morris. Dr. Ralph Horton is superintendent of the new hospital.

New York City

Hospital Moves Patients to New Location.—Patients in the Manhattan General Hospital were moved from the old hospital at 161 East Ninetieth Street to its new location in the building of the former Lying-In Hospital at 307 Second Avenue, July 26, the New York *Times* reported. The Lying-In Hospital merged with New York Hospital in 1929 and moved to that institution in 1932, leaving its building vacant. It has been completely renovated and has accommodations for 300 patients.

Hospital Department Official Retires.—Dr. Mark L. Fleming, general medical superintendent of the city department of hospitals since 1930, will retire October 1, having reached the retirement age. Dr. Fleming was graduated from Cornell University Medical College in 1901 and has been associated with the city hospital service since his internship at Bellevue. For several years before he was named to his present post he was superintendent of Bellevue. Dr. Sigismund S. Goldwater, commissioner of hospitals, announced that Dr. Fleming would be appointed to the department's board of administrative consultants.

Laboratory Dedicated.—Dr. Isidore W. Held, clinical professor of medicine at New York University College of Medicine, was honored on his sixtieth birthday, when the pathology laboratory at Beth Israel Hospital was dedicated in his honor. Dr. Held is an attending physician at the hospital. Dr. Nathan Ratnoff, medical director of the hospital, presided at the ceremony and speakers were Mr. David I. Podell, president of the board of trustees; Justice Aaron J. Levy, a director of the institution; Dr. John Wyckoff, dean of New York University College of Medicine; Dr. Emanuel D. Friedman, professor of neurology at the College, and Dr. Meyer R. Robinson, attending gynecologist at Beth Israel.

Dr. Lewis Appointed Director of State Psychiatric Hospital.—Dr. Nolan D. C. Lewis, professor of neurology at Columbia University College of Physicians and Surgeons and associate director of the Neurological Institute, has been appointed director of the New York Psychiatric Institute, effective September 1. Dr. Lewis is a native of Pennsylvania and took his medical degree at the University of Maryland School of Medicine in 1914. He was director of clinical psychiatry and director of laboratories at St. Elizabeth's Hospital, Washington, D. C., from 1923 to 1935, when he was appointed at Columbia. He was also professor of experimental pathology at George Washington University School of Medicine from 1920 to 1924 and was appointed clinical professor of psychiatry in 1925. Dr. Lewis succeeds Dr. Clarence O. Cheney, who was recently made director of Bloomingdale Hospital, White Plains.

NORTH CAROLINA

State Board Meeting.—The North Carolina Board of Medical Examiners will hold its next meeting November 30 at the Hotel Carolina, Raleigh. Only candidates for license by indorsement of credentials will be considered. Dr. Benjamin J. Lawrence, Raleigh, is secretary of the board.

Society News.—A group of papers on obstetric subjects was presented at a meeting of the Catawba Valley Medical Society, July 14, at the home of Dr. John D. Rudisill, Lenoir, by Drs. Williamson Z. Bradford, Charlotte; Abner M. Cornwell, Lincolnton, Glenn S. Edgerton and Henry H. Menzies, Hickory.——Dr. William S. Justice, Asheville, addressed the Buncombe County Medical Society, Asheville, July 13, on "Indications for Exploration of the Common Bile Duct."

Personal.—Dr. Hamilton W. McKay, Charlotte, has been elected president of the State Board of Medical Examiners.——Herbert C. Tidwell, Ph.D., formerly of Johns Hopkins University, Baltimore, has been appointed Grier research professor of biochemistry at Wake Forest College School of Medicine, Wake Forest.——Dr. Thomas G. Faison, Winton, has been appointed health officer of Hertford County's new department of health.——Dr. Wiley D. Forbus, head of the department of pathology at Duke University School of Medicine, Durham, has been elected a member of the National Board of Medical Examiners. He succeeds Dr. Howard T. Karsner, Cleveland. ——Dr. William B. Hunter, Lillington, has been named health officer of Harnett County.

PENNSYLVANIA

Society News.—The thirtieth annual meeting of the West Branch of the Fifth Councilor District of the Medical Society of the State of Pennsylvania was held at the York Country Club July 16. Dr. Francis C. Grant, Philadelphia, made an address on "Head Injuries and Spinal Cord Tumors"; Dr. Theodore B. Appel, Lancaster, "Maternal Mortality in the Fifth Councilor District," and Mr. Ray Jansen, publicity director of the state society, "The Medical Society and the Press."——Dr. Samuel Wolman, Baltimore, conducted a clinic on tuberculosis as guest of the Cambria County Medical Society, July 9, at the State Sanatorium for Tuberculosis, Cresson.——Dr. George W. Hawk, Sayre, was elected president of the Association of Residents and Ex-Residents of the Robert Packer Hospital and Guthrie Clinic at a meeting in Sayre, June 26. ——Dr. John H. Musser, New Orleans, addressed the Lehigh Valley Medical Association at its fifty-sixth annual meeting at Pocono Manor, July 15, on "Abdominal Pain Due to Extra-Abdominal Disorders."

Philadelphia

Medical College News.—Sir David P. D. Wilkie, professor of surgery, University of Edinburgh Faculty of Medicine, Edinburgh, Scotland, will give a series of twenty-five lectures at Jefferson Medical College in November and December, the college announces.

TENNESSEE

Medical Society Protests Against Speeding Ambulances.—The Memphis and Shelby County Medical Society recently adopted a resolution protesting against unnecessary speed in the driving of ambulances. A letter was sent to all ambulance companies in the city asking them to cooperate with the police department in making the streets safe. It pointed out that fast driving of ambulances was almost invariably unnecessary for the welfare of a patient and altogether unsafe for both vehicle and pedestrian traffic. The society also protested against loud blowing of horns.

TEXAS

Personal.—Dr. John T. Moore, Houston, received the honorary degree of doctor of science from Texas Christian University, Fort Worth, at the June commencement.

Society News.—The North Texas Medical Association held its annual meeting in McKinney June 9-10. Among speakers were Drs. Percy M. Girard, Dallas, on "Prevention and Treatment of Ankylosis Following Trauma"; Vernon L. Tuck, Sherman, "Treatment of Lobar Pneumonia by Artificial Pneumothorax"; Charles W. Flynn, Dallas, "Management of

Pelvic Abscesses in Debilitated Cases"; Samuel H. Kahn, Dallas, "Insulin Protaminate in Treatment of Diabetes," and Edwin G. Faber, Tyler, "Allergy in General Practice."——Drs. George L. Carlisle and Ben R. Buford, Dallas, addressed the Clay, Montague and Wise Counties Medical Society recently on "Irregularities of the Heart" and "Management of Diabetes and Its More Common Complications" respectively.

VIRGINIA

Personal.—Dr. Douglas Vanderhoof has been chosen chairman of the executive committee of the board of visitors of the Medical College of Virginia, Richmond.——Dr. Alexander W. Terrell, Lynchburg, was guest of honor at a dinner, June 30, given by several hundred residents of Lynchburg, where he has practiced for fifty years. The gathering was at Randolph Macon Woman's College, where Dr. Terrell has been resident physician for many years.——Dr. Ralph G. Beachley, Chestertown, Md., has been appointed director of the southwest division of the state health department. He succeeds Dr. Edgar C. Harper, Richmond, who has been appointed head of the state bureau for crippled children.——Dr. John Carlisle Neale Jr., formerly health officer of Henrico County, has been appointed health officer of Augusta County.

WASHINGTON

State Medical Meeting at Yakima, August 31.—The forty-seventh annual meeting of the Washington State Medical Association will be held in Yakima, August 31 to September 2, at the Elks Temple. The annual golf tournament will be held Monday at the Yakima Country Club and the business and scientific programs will begin Tuesday morning September 1. Guest speakers and their subjects will be:

Dr. Frederick H. Falls, Chicago: Eclamptogenic Toxemia; Early Diagnosis of Carcinoma of the Cervix Uteri; Relationship Between Fibroids and Carcinoma of the Uterus.
Dr. William S. Middleton, Madison: Circulatory Problems of Surgery; Coronary Occlusion; Present Status of the Pernicious Anemia Problem.
Dr. Frank J. Clancy, director, Bureau of Investigation, American Medical Association, Chicago: Your American Medical Association.
Dr. Louis H. Clerf, Philadelphia: Diagnosis and Treatment of Suppurative Conditions of the Lung.
Judge Charles P. Moriarity, Seattle: discussion of a paper on malpractice presented by Dr. Walter Kelton, Seattle.

Dr. Clancy will also address the seventeenth annual meeting of the Public Health League at the Commercial Hotel Tuesday noon on "Nostrums and Quackery" and the Woman's Auxiliary Tuesday morning on "Cosmetic Fairy Tales." A dinner dance will be given at the Yakima Country Club Tuesday evening. Fraternities and university alumni will hold reunion luncheons Wednesday noon. Dr. Delmar F. Bice is president of the association.

WEST VIRGINIA

Course in Pediatrics.—A graduate conference in pediatrics was begun at the Ohio Valley General Hospital, Wheeling, July 16, to continue each Thursday for five weeks. Dr. George M. Lyon, Huntington, is in charge of the work, which is financed by funds made available under the Social Security Act through the Children's Bureau.

WISCONSIN

Personal.—Dr. David E. W. Wenstrand, Milwaukee, has been appointed medical director of the Northwestern Mutual Life Insurance Company to succeed Dr. John W. Fisher. Dr. Fisher retired from active duty August 1 with the title of medical director emeritus after fifty years of service. Dr. Wenstrand was appointed assistant medical director Oct. 1, 1933.

Society News.—Drs. Waltman Walters, Rochester, Minn., and Francis D. Murphy, Milwaukee, addressed the Ninth Councilor District Medical Society in Marshfield, July 23, on gallbladder disease and heart disease, respectively. Clinical demonstrations were presented at St. Joseph's Hospital by the following Marshfield physicians: Drs. Frank A. Boeckman, pneumonia, empyema and lung abscess; Robert S. Baldwin, clinical experiences with new insulin; Karl H. Doege, hearts in acute infections; Paul F. Doege, carcinoma of the colon; Walter G. Sexton, bladder tumors, and Lyman A. Copps, multiple brain abscesses following ear disease.——Drs. Laurence V. Littig and Lester McGary, Madison, addressed the Sauk County Medical Society, Baraboo, July 29, on "Skin Cancer and Its Treatment" and "Hay Fever and Asthma" respectively. ——An open meeting was held at the Milwaukee Academy of Medicine, Milwaukee, June 4, as the opening of the educational program of the Rogers Memorial Sanitarium, Oconomowoc. Mr. Clifford W. Beers, New York, executive secretary of the National Committee for Mental Hygiene, was the speaker.

CANAL ZONE

Lowest Death Rate.—The general death rate in the Canal Zone in 1935 was 5.89 per thousand, the lowest in the history of the zone, it is reported. The decline from 7.52 in 1931 was attributed to absence of epidemic diseases and to the fact that new employees must pass a rigid examination.

Society News.—At a meeting of the Medical Association of the Isthmian Canal Zone in the Gorgas Memorial Institute, Panama, July 21, speakers were Lieut.-Col. Raymond A. Kelser, Ph.D., Quarry Heights, on "Equine Osteomalacia"; Dr. Mahlon Ashford, Balboa Heights, "Nature of Immunity to Malaria in Its Relation to Antimalarial Therapy," and George R. Callender, Balboa Heights, "Diarrheal Disease in the U. S. Army."

HAWAII

Territorial Election.—Dr. Lyle G. Phillips, Honolulu, was elected president of the Hawaii Territorial Medical Association at the recent annual meeting. Dr. Douglas B. Bell, Dillingham Building, Honolulu, has been elected secretary.

GENERAL

Cruise Postponed.—A cruise planned for this month by the Latin-American Congress of Physical Therapy, X-Ray and Radium has been postponed to March 1937. Sessions of the congress will be held in the National University of Medicine, Guatemala City, Guatemala. Dr. Norman E. Titus, 730 Fifth Avenue, New York, is president of the congress; Dr. Madge C. L. McGuinness, 1211 Madison Avenue, secretary, and Dr. Cassius L. de Victoria, 1013 Lexington Avenue, executive director.

Warning—Fraudulent Salesman.—Two New Jersey physicians have recently reported activities of a man using the name D. A. Thomson and representing himself to be an agent of the "American Diathermy Rubber Co., Ltd., 329 Walnut Street, Philadelphia." He takes orders for goods, offering reductions for cash, and collects the money, but the goods do not arrive. Letters addressed to the firm name given are returned unclaimed and inquiry at the Philadelphia telephone company gave no information.

Society News.—The second annual meeting of the Mississippi Valley Medical Society will convene at the Hotel Burlington, Burlington, Iowa, September 30-October 2. Dr. Harold Swanberg, 211-224 W. C. U. Building, Quincy, Ill., is secretary. ——The Central Association of Obstetricians and Gynecologists will hold its eighth annual meeting at the Hotel Statler, Detroit, October 15-17.——The Inter-State Postgraduate Medical Association of North America will hold its annual assembly at the Public Auditorium, St. Paul, October 12-16. Dr. Tom B. Throckmorton, Des Moines, Iowa, is secretary.

Premedical Honorary Fraternity.—Alpha Epsilon Delta, national honorary premedical fraternity, celebrated its tenth anniversary at its annual meeting recently at Baylor University, Waco, Texas. The fraternity voted to use its influence to encourage premedical students to take a four year general course for a bachelor's degree as the best preparation for the study of medicine. It also recommended closer contact with the American Medical Association and other organizations concerned with medical education and adopted as a national project the promotion of general education in preventive medicine among college students. A chapter was installed at the University of Oklahoma after the convention, raising the number of chapters to seventeen. Only universities and colleges approved by the Council on Medical Education and Hospitals of the American Medical Association and members of recognized university associations are eligible to petition for chapters. The fraternity was founded at the University of Alabama in 1926. Emmett B. Carmichael, Ph.D., University, Ala., is grand president and Maurice L. Moore, Ph.D., New Haven, Conn., is grand secretary.

Annual Report of Rockefeller Foundation.—During 1935 the Rockefeller Foundation expended $12,725,439, of which $2,733,050 was for medical science and $2,200,000 for public health work. The major portion of the appropriation for the medical sciences was contributed to projects for the advancement of psychiatry. These included grants to the Institute for Psychoanalysis, Chicago; Johns Hopkins University School of

Medicine, Baltimore; Institute of the Pennsylvania Hospital, Philadelphia; Harvard Medical School and Massachusetts General Hospital; University of Michigan Medical School, Ann Arbor; University of Colorado School of Medicine, Denver, and the University of Chicago School of Medicine. Fourteen research undertakings in clinical psychiatry and related fields were aided in the United States, England, Holland and Switzerland. Grants were also made to the National Committee for Mental Hygiene, New York; the North Carolina Commission for Study of the Care of the Insane and Mental Defectives, and the Massachusetts Department of Mental Diseases. Seventy-two fellowships in the medical sciences were administered during the year. The International Health Division sponsored studies on yellow fever, malaria, hookworm, tuberculosis, yaws, the common cold, diphtheria, influenza, typhoid, mental hygiene and smallpox vaccine in various parts of the United States and in numerous foreign countries. In addition, government health services were aided in many states and countries and advanced training in public health and public health nursing was made available to 188 persons. In the field of the natural sciences the foundation expended $2,426,125, with most of the appropriations in experimental biology. These projects included research in universities in many parts of the United States, Canada and Europe on electro-encephalography, biologic effects of heat, neurophysiology, cellular physiology, physiology of reproduction, the hormones and vitamins. Fifty-one fellowships in this field were administered during the year.

FOREIGN

Personal.—Lord Dawson of Penn, physician in ordinary to King Edward VIII, was made a viscount in the list of honors conferred by the king on his forty-second birthday recently.—— Prof. Hans Holfelder, Frankfort-on-Main, and Prof. Alban Köhler, Wiesbaden, have been appointed honorary members of the American College of Radiology. —— Dr. Etienne Burnet, formerly vice director of the Pasteur Institute of Tunis, has been appointed director to succeed the late Dr. Charles Nicolle. Dr. Burnet has recently been a member of the Health Section of the League of Nations.——Dr. René Sand, Paris, technical adviser to the League of Red Cross Societies since the World War, has resigned to become secretary general of the Belgian ministry of health. Dr. Sand is a native of Belgium.

French "Medical Days" in 1937—The standing committee of the "Journées médicales de Paris" announces a series of meetings to be held June 26-30, 1937, during the International Exhibition. The committee conducted similar meetings in 1926 and 1929. Physicians, pharmacists, veterinary surgeons, biologists, physicists and chemists of all countries are invited to participate. The subject selected for consideration is "Hormone and Endocrine Therapeutics." Mornings will be devoted to demonstrations in hospitals, schools and institutes of biology. Those who wish to attend are asked to write to: Service des Journées médicales: Revue médicale française, 18 Rue de Verneuil, Paris 7.

Government Services

Vacancies in Navy Medical Corps

An examination for commission in the medical corps of the U. S. Navy will be held beginning December 1 to fill about twenty-five vacancies. The examination will be held at the U. S. Naval Hospital, Mare Island, Calif.; U. S. Naval Hospital, Great Lakes, Ill., and the U. S. Naval Medical School, Washington, D. C., when examining boards will be in session. Candidates for admission must be between the ages of 21 and 32 years at the time of appointment, graduates of class A medical schools, and must have completed an internship of one year in a hospital accredited for interns by the American Medical Association and the American College of Surgeons. Further information may be obtained from the surgeon general, U. S. Navy, Bureau of Medicine and Surgery, Navy Department, Washington, D. C.

CORRECTION

"Snyder Products Co."—In THE JOURNAL, August 1, page 371, appeared an item relative to the Snyder Products Co., in which the cooperation of Dr. Louis Fishman with this company was emphasized. It should be pointed out that Dr. Louis Z. Fishman is not the physician concerned in this matter.

Foreign Letters

LONDON

(From Our Regular Correspondent)

July 4, 1936.

The British Medical Association and "Umckaloabo"

The council of the British Medical Association has been faced with a request from a lay body known as the Committee of Investigation on Treatments of Tuberculosis to investigate "umckaloabo," a substance also known as "Stevens Consumption Cure." The committee has obtained a sum of $50,000 and proposes to equip a small home for the purpose of testing the treatment. The council of the Association was asked to advise and assist (1) as to the appointment of a resident medical officer at the home to keep cases under observation and make records; (2) to invite prominent physicians to form a committee to advise as to the types of patients to be admitted and to keep them and the home under observation. The council set up a special committee to consider the matter, and a joint meeting of this committee and the committee mentioned was held. The evidence for and against umckaloabo was summarized at this meeting and the method by which further inquiries might be prosecuted was discussed. The following memorandum was submitted by the council to the lay committee:

General principles are first laid down. It is the duty and desire of the medical profession to regard with attention any method proposed for the treatment of disease, from whatever source, provided there is scientific or empirical evidence which justifies some degree of reasonable expectation that the method may prove beneficial and is not likely to do harm. Every physician is free to use any method he believes to be for the patient's benefit. But the profession ought not to spend valuable time in testing clinically enterprises which have not adequate presumptive evidence in their favor. Many schemes of treatment once greatly vaunted have proved to be useless or even harmful. The medical care of a patient cannot be arranged as a pure scientific experiment; the patient's interest is paramount. But this does not mean that a new drug or method cannot be systematically studied, provided the interest of the patient, not the completeness of the experiment, is the deciding factor.

With regard to the particular proposal, the council of the association says that the financial support lent to it must receive cordial recognition as a humane desire to relieve suffering. Nevertheless any one who spends $50,000 on an enterprise without reasonable expectation of success acts against the general interest, seeing that so many opportunities for service halt for want of money. The face value of the reports received by the lay committee is impressive, though they would need some expert scrutiny and unexpected recoveries from tuberculosis occasionally occur quite apart from administration of any drug. Existing opportunities for testing new methods are numerous. In the public tuberculosis service of the country under the control of the local health authorities are institutions where many recommended forms of treatment are tested. For example, the Tuberculosis Service of Lancashire has recorded many investigations of this order, and if adequate justification can be submitted umckaloabo might be included. As compared with such a service already organized, a new home or hospital would have obvious disadvantages. Assuming that not less than twenty beds would be adequate and that the experiment extended over three years, the equipment and administration expenses would be considerable.

New Scheme for Research in Tropical Medicine

A new scheme of fellowships and appointments for research in tropical medicine is announced by the Medical Research Council on the advice of the Tropical Medical Research Com-

mittee, recently appointed after consultation with the colonial office. Three junior scholarships are offered immediately for award to physicians wishing to receive training with a view to careers in research work in tropical medicine. Preference will be given to candidates who already have had preliminary experience of research in some branch of medical science. Subject to satisfactory reports, the fellowships will be tenable for three years. The first year will be spent at the School of Tropical Medicine, the second in research work in the same or some other institution at home, and the third largely in work under direction at some center in the tropics. The stipends will be $1,500, $2,000 and $2,500 in the successive years, with an additional allowance during service abroad and necessary expenses. The men who undergo this training will be eligible and well qualified for various appointments, apart from further employment under the scheme. At least one senior fellowship will be available for those who have held the junior fellowship. This will be awarded for three years at a stipend of from $3,000 to $3,750, with additional allowance during service abroad and expenses. The time will be spent mainly in research work in the tropics. The council is also prepared to consider applications for senior fellowships from candidates who have had adequate experience in research work, whether already trained in tropical medicine or not.

The council intends to establish in due course, as suitable investigators become available as the result of this scheme, permanent and pensionable appointments for research work in tropical medicine, including senior posts. Members of this research staff will work partly in the tropics and partly in institutions at home. The efforts of the Medical Research Council to this field have the support of the colonial office and the active cooperation of the schools of tropical medicine in Great Britain.

Prehistoric Surgery

At the Wellcome Research Institution Mr. J. L. Starkey described the discoveries made by the Wellcome Archaeological Research Expedition at Lachish, about 25 miles southwest of Jerusalem. From the Lachish reliefs, found by Layard in 1854, in which contemporary artists showed the inhabitants of the city in great detail, it appeared that the Hebrews were the rulers of the city when it was attacked by Sennacherib in 701, B. C. After its destruction 1,500 bodies were thrown into a hole in the roof of a tomb chamber. From these bodies no fewer than 700 skulls have been recovered and are now in London awaiting scientific examination. It is hoped that they will give reliable information of the type of people living in Judah during the time of the Jewish monarchy and possibly show whether they were of purely Jewish stock or contained much of the original Canaanitish stock. Two of the skulls showed a remarkable form of trephining. Commonly that operation leaves a circular hole in the skull, but in the Lachish specimens the holes were cut square, a method previously known only in the Inca civilization of America. In one case the operator had begun to work on the right parietal bone but had completed the operation on the left.

The British College of Obstetricians and Gynaecologists

The regulations for admission to the membership of the British College of Obstetricians and Gynaecologists have been revised. When the original regulations were made, on the establishment of the college, the candidates were usually working in recognized hospitals and so were personally known to members of the council. But with the rapid development of the college and increase in application for membership both at home and from overseas, the examination has had to be reorganized. The guiding principle has been that it should be a test of sound clinical training and not, as so many examinations unfortunately are, a proof that the successful candidate is a good examinee. The oral examination will consist of two parts: (1) a discussion of twenty-five selected obstetric cases attended by the candidate of which he has submitted records; (2) pathology. Applicants must have held resident appointments for six months in general medicine or surgery and for the same period in obstetrics and again in gynecology. Concurrently with this or separately they must have attended for six months at antepartum, postpartum and infant welfare clinics. Case records of ten gynecologic cases are required. The candidate will be asked to describe orally his treatment and his reasons for it. The cases must be vouched for as his own by a superior officer of the hospital. Commentaries—one obstetric and one gynecologic—not exceeding 2,000 words on one of the obstetric and one of the gynecologic cases, or preferably on a group of cases, must be submitted. The clinical examination will include a report on a selected case and an examination of other cases at the discretion of the examiner.

The Tragedy of a Surgeon

On May 22 Mr. H. P. Nelson, specialist in surgery of the chest, pricked his finger with a diathermy needle while operating at the Brompton Hospital. The case was a clean one, but he had to do in the evening several dressings of other cases and from one of them his finger became infected. Next morning streptococcic cellulitis was evident and it spread so rapidly that his left arm had to be amputated; unfortunately this failed to check the disease and he died June 24. He was only 34 and after the usual struggle was just beginning to ascend the ladder of surgical fame. Born in New Zealand, he was educated at Cambridge and at St. Bartholomew's Hospital, where he became demonstrator of anatomy and did research work. He was appointed instructor in thoracic surgery at the University of Michigan Hospital, Ann Arbor. Returning to England, he became chief assistant to Mr. J. E. H. Roberts at St. Bartholomew's Hospital and assistant surgeon to the Brompton Hospital for Diseases of the Chest. He helped to found a surgical department at the Papworth Village Settlement and a special hospital for thoracic surgery under the London County Council. With Mr. Roberts he published the first complete account in this country of the operation of pulmonary lobectomy. He was recently appointed assistant surgeon to the London Hospital. His abilities and character were greatly esteemed in the profession and there is no doubt that a great career has been cut short. A memorial fund for his widow and two children has been inaugurated by Lord Horder and other leading members of the profession.

The Blood Transfusion Service of the British Red Cross Society

The report of the Blood Transfusion Service of the British Red Cross Society shows that the calls on the London service during 1935 made a record: 4,701 calls were received, compared with 3,855 in 1934 and 3,017 in 1933. The growth of the service has been remarkable, for in 1925, when the British Red Cross Society took it over, there were only 428 calls. Thus in ten years the number has multiplied eleven-fold. On an average each donor serves twice per annum, and in 1935 the resources of the service were strained to the utmost. One factor in the increased calls was the introduction of "drip transfusion," originated by Drs. Mariott and Kekwick of the Middlesex Hospital, which allows the introduction of the corpuscular content of from 8 to 10 pints of blood by means of a steady drip, the process taking two or three days. The effects have been so successful that other hospitals are using this method. Though every effort is made to obtain donors from relatives and friends of the patients, a heavy burden has been imposed on the transfusion service. During the year 222 night calls were received, between 11 p. m. and 9 a. m., compared with 174 in 1934. Two donors have now served on more than sixty

occasions, while 619 badges have been gained by donors who have given ten or more transfusions. An analysis of the active list shows that the members have on an average 8.91 transfusions to their credit. The serum agglutinins of every member are carefully checked. At the International Blood Transfusion Conference, held in Rome last September, the Belgian delegate, Dr. Anet, said that the initiative of the British Red Cross Society in its transfusion service had served both as a model and as an inspiration for the creation of similar services throughout the world.

Decline in Syphilis in England

Speaking at a meeting of the British Social Hygiene Council, Sir Kingsley Wood, minister of health, said that any compulsion in the treatment of venereal disease was likely to defeat its own end. Results generally were improving. Efforts made in the last twenty years to educate the public had resulted in a more general realization of the dangers and of the importance of seeking medical advice at an earlier date. The incidence of syphilis was on the decline. Recent infections dealt with at the treatment centers in 1935 were just under 6,000, as compared with over 9,000 in 1925, while the mortality of syphilis in infants in 1934 was less than half what it was in 1924, and about a sixth of the mortality in 1917.

Involuntary Dyeing of the Hair

Two dermatologists, Drs. A. M. H. Gray and R. A. E. Klaber, have described in the *British Journal of Dermatology* a manner in which the hair may become dyed that has received no attention in the textbooks. A woman, aged 50, gave much attention to her silver gray hair. She had it cut, washed and water waved at frequent intervals. For some want of profusion after an accident her physician prescribed a lotion, which she used daily and then discontinued as "it took the wave out of her hair." During the next three weeks she had the hair shampooed prior to a permanent wave. According to the usual practice the hair was treated with an ammoniacal spirit lotion before being curled and placed in the heating tubes. When the hair was removed from the tubes a striking change was observed. Except for the extreme front and back and the proximal one or two inches of each hair the whole was diffusely dyed. The color was brownish black in front, fading gradually to light brown behind. Hydrogen peroxide failed to bleach the color. Microscopic examination of the dyed hair showed a uniform brown coloration with absence of pigment granules. Chemical investigation showed that this pigment was mercuric sulfide. It was found that the lotion prescribed by her physician contained a grain of mercury bichloride to the ounce.

Mercury is among the metals the salts of which have been used in progressive hair dyes. For this purpose subsequent application of heat or of a sulfur compound is necessary. Thus in the McCall Anderson formula a 1 in 250 solution of the bichloride is followed by a 12.5 per cent solution of sodium thiosulfate. A similar case has been reported by Philipsen (*Ugesk. f. læger.* **95**:746 [June 29] 1933). In both cases it was clear that the dyeing was dependent on combination of the mercuric salt with sulfur, presumably derived from cystine content of the hair keratin, and that the reaction required the high temperature used in the permanent waving. A similar case has been reported in America by Dr. C. J. White of Boston (*New England J. Med.* **214**:708 [April 2] 1936). A white-haired woman who allowed herself one permanent wave a year was annoyed because on the last two occasions her hair turned a slate color and her friends would think she was foolish enough to have her hair dyed. Dr. White adopted the explanation just given, though it was not actually proved that she used a mercurial lotion. The dye did not yield to any decolorizer which he dared use on her delicate hair, but time restored the normal color.

PARIS

(From Our Regular Correspondent)

July 13, 1936.

The Ninth Annual Pediatric Congress

This year's meeting was held May 28 at Bordeaux under the presidency of Prof. Charles Rocaz. Pediatricians from foreign countries, including the United States, took part in the program.

In a discussion of the insulin treatment of infantile diabetes, Professor Aubertin of Bordeaux stated that all cases of diabetes in infants and children presented clinically a progressive evolution and that insulin treatment should be begun as early as possible. Since insulin permits the child to metabolize the necessary quantity of food, it is essential that such an amount of nourishment be given as the child requires. A simple rule is to give 1,000 calories for a child 1 year of age and 100 calories for each additional year. The proportion of proteins that is most convenient to order is 15 per cent of the total ration in calories during the first five years, 12 per cent for children between 5 and 10 years of age and 10 per cent between the ages of 10 and 15 years. During the early period of insulin therapy a diet poor in glucides (from 20 to 25 per cent of the total calories) and rich in lipids (from 65 to 70 per cent of this diet) was given. In time, the glucide tolerance gradually lessened. Hence a modified diet is in use at present, which is rich in glucides (50 per cent of the total calories) and poor in fats (from 35 to 40 per cent of the total calories). It is more difficult to control the diabetes at the beginning of the treatment, but later an appreciably increased tolerance is observed. The establishment, fractioning, spacing and distribution of the doses of insulin ought to be adjusted according to the reactions in the daily variations and the effect of different foods on the blood sugar content. The regulation of the dosage is governed primarily by the examination of the urine after each dose of insulin and secondarily by the blood sugar content at various intervals of the day. Muscular exercise acts as a valuable aid to insulin. As to the complications of insulin therapy in children, inflammatory reactions are rare and not serious. Complications due to intolerance are seldom observed at present, because of the better technic employed in the preparation of insulin. Diabetes is seldom observed in children less than a year old. Above this age the prognosis is unfavorable in spite of insulin therapy except in certain cases in which the disease is transitory.

The acute infectious diseases do not affect diabetic any more seriously than nondiabetic children of the same age. It is essential to give the same total number of calories without decreasing either the glucides or the doses of insulin. In fact, the latter should be increased because of the appearance of a certain degree of insulin resistance. Operative interventions, thanks to insulin, can be carried out as safely in diabetic as in nondiabetic children. Diabetic coma, if treated promptly, is less serious in children than in adults, unless complicated by some infective process.

With insulin therapy and an adequate diet, growth is not interfered with. Cure of the disease is exceptional, but one frequently sees a marked improvement in tolerance, especially if a diet rich in glucides is given. In many children, increased amounts of insulin are indicated for two or three years because the diabetes may be subject to inexplicable exacerbations in spite of apparent control of the disease. Such exacerbations occur, however, more frequently in children who have been insufficiently treated.

The mortality from infantile diabetes is about 2 per cent in centers in which adequate treatment can be carried out. Forssell has reported a mortality of 67 per cent in Finland, even when insulin was employed, but here the children lived in rural districts where proper care was lacking.

Insulin in Nondiabetic Conditions in Children

In discussing the subject of insulin in nondiabetic conditions in children, Marcel Lelong of Paris first took up insulin therapy in nurslings, which renders valuable aid in the treatment of denutrition of the second degree and even in advanced cases, as follows: (1) in cases of anorexia if the latter is secondary, i. e., not the result of some organic cause (infectious or other); (2) when the difficulty of water fixation plays an important part in the inability to add weight; (3) when, and this is infrequent, disturbances of glucide metabolism exist.

The contraindications to the use of insulin are: 1. A fall in the initial weight of the new-born; here the use of insulin is dangerous. 2. In denutrition syndromes of definitely organic origin; here it is more important to treat the underlying (infectious, alimentary, digestive) cause than to treat the symptom of denutrition. 3. In true denutrition (athrepsia), in which insulin is of no avail. 4. In denutrition conditions when edema is present.

Accidents due to insulin therapy are not to be underestimated. Fortunately they are mild (sudden pallor, profuse sweats, feeble and rapid pulse) but cases in which convulsions occur have been reported. The important fact to bear in mind is that, as the result of the glycemia equilibrium in infants, such accidents cannot be foreseen.

Insulin therapy in nurslings calls for a diet rich in carbohydrates. It is necessary that the insulin hypoglycemia should be counterbalanced by the alimentary hyperglycemia. Only small doses of insulin can be used, a clinical unit per kilogram a day, in one or two subcutaneous injections. Carbohydrates can be given by mouth or by the parenteral route. A good rule is to assure a minimum of 3 Gm. of dextrose per unit of insulin. The duration of the treatment is variable. A safe method is to use insulin for two or three weeks and then discontinue it for an equal length of time.

In infants, insulin therapy encounters greater obstacles than in nurslings. The usual dose is from 10 to 15 units a day with each of two feedings, the latter to contain an ample amount of carbohydrates. Insulin therapy does not exclude the necessity of rest and of a good general and alimentary hygiene, as well as open air life.

In general, Lelong considers insulin of secondary importance in nondiabetic conditions in children.

Lereboullet and Gournay of Paris have followed, since 1921, thirty cases of infantile diabetes in the hospital with three deaths and thirty-five cases in private practice with fourteen deaths, the latter being due to the fact that treatment was more difficult to carry out outside the hospital. Fifty-seven per cent were boys and 43 per cent girls. The real influence of both syphilis and tuberculosis have not as yet been sufficiently taken into consideration. In one infant the diabetes appeared two months after an attack of mumps and one month after an acute pancreatic syndrome. In four children the diabetes was of the renal type. When an infantile diabetes is correctly treated, the insulin is well tolerated. Death is usually the result of discontinuation of the insulin therapy, lack of supervision of the diet and intercurrent disease. Education of the parents is essential. The same is true of frequent urinary and blood examinations in order to act as a guide for the doses of insulin.

Professor Fanconi of Zurich, Switzerland, reported fifty cases in which very satisfactory results were obtained with a diet containing little albumin and fat, with a base of fruits and vegetables.

EPIDEMIOLOGY AND PATHOLOGY OF INFANTILE ACRODYNIA

The subject of the second symposium was the epidemiology and pathology of infantile acrodynia. In France the term acrodynia has been adopted to designate the syndrome of an epidemic disease which affects children from 6 months to 7 years of age, rarely later than that period. At times it is encountered in adults. It begins by irritability, digestive disturbances and a tired feeling. At its height, pains are complained of in the extremities, accompanied by changes in sensation, paresis, psychic disturbances with rapid regression of the intelligence and finally trophic changes involving especially the flexor aspects of the extremities, and the condition may terminate in a mutilating gangrene of the fingers and toes. The duration of the disease is about six months, but complete recovery is the rule.

It seems to have first appeared in northern Germany in 1898 but its existence has been reported in nearly all parts of the world except the Scandinavian countries, the majority of cases being observed in the winter and spring. Whether the disease is contagious or not has not been established, but isolation of the child for a period of several weeks is certainly advisable. The relation to other infections such as influenza, poliomyelitis and encephalitis is not clear at present, but it would appear as though there is little if any connection between these diseases and infantile acrodynia.

In the discussion, Mouriquand of Lyons reported several cases in children living in the same or adjacent houses but in which there had not been any apparent contact. In four necropsies, unquestionable lesions of the neurovegetative system were found, especially at the level of the cervical and dorsal sympathetic ganglions. Rabbits inoculated by the cerebral route all died within one or two months after presenting paralytic symptoms.

Beutler of St. Etienne said that he had observed 102 cases since 1925 and, in addition, twenty-four cases had been verified by others in adjacent counties. They seemed to bear no relation to other epidemics or to whether the child was living in a large city (fifty-three of the 102 cases had occurred in St. Etienne) or in a rural community. Sequelae such as more or less important mutilations, decalcification of bone and a neuropathic state had followed in some children. Two similar familial examples of contagion were cited; hence physicians should report cases of infantile acrodynia. Béraud of La Rochelle reported twenty-nine cases, of which fifteen were in an area 28 miles in circumference. There seemed to be no true epidemic, but sporadic foci.

BERLIN

(From Our Regular Correspondent)

July 6, 1936.

Drastic Changes in Control of Advertising

Numerous attempts to place the advertising of therapeutic aids on a sound basis have been reported from time to time. Now that a decree of the Advertising Council of German Economic Life has been issued, the diverse and unsatisfactory control exercised by the individual German states has been swept away. Specific provisions now cover the material, style, methods and inspection of advertising, and their observance will be enforced by the police. The new laws concern therapeutic aids in the broadest sense of the term; this means not only the advertising of medicaments properly speaking but that of therapeutic procedures and methods as well. All types of advertising are included, even of a relatively private nature. Medicaments are defined according to the new statute as "substances which are designed to prevent, palliate or eradicate sickness, pain or bodily injuries of any kind whatever in man or beast." Further provisions cover agents of local or general anesthesia such as are employed for alleviation of labor pains; diagnostic aids; remedies for senile phenomena, especially somatic and psychic conditions; aids to rejuvenation; aphrodisiacs; aids in overcoming habitual use of alcohol and tobacco, and finally foodstuffs, food preparations, cosmetics and disinfectants so far as the definition of medicaments may apply to these. The catalogue of substances of which the new law takes cognizance is inclusive indeed.

The illegality of "misleading advertisements" is given a prominent place in the law. Deceptions, according to the

wording of the statute, may be of different sorts: false statements concerning the composition of a substance or the condition and quality of an appliance, attributing to substances exaggerated and nonexistent virtues, or propaganda calculated to create the false impression that successful results may be regularly, certainly or in all probability anticipated from the use of a substance or that such a substance may be successfully used for a variety of diseases. It is deemed a deception if false statements are made concerning the education, qualifications or professional standing of the advertiser or if the impression is created that testimonial statements are being furnished disinterestedly. Any advertising is held illegal which on investigation is found to involve the treatment of contagious diseases by the patients themselves or by persons other than physicians; this applies also to the treatment of venereal diseases or of dysfunctions of the genitalia. Further prohibited is the offering of absent treatment and any advertisement that creates a fear of impending death or otherwise evokes anxiety and apprehension. No advertisement of a substance for which a prescription is legally necessary shall circulate among the public, and the same applies to any advertising of substances and appliances purported to prevent, palliate or eradicate disease caused by malignant growths or infectious diseases (including tuberculosis) the reporting of which is compulsory. The advertising of substances and appliances designed for the amelioration of venereal disease or for the prevention or interruption of pregnancy is confined to physicians, pharmacists and specially licensed business concerns. For the advertising of medicaments to be used during pregnancy, special approval is required for each substance. The same rule applies to procedures and treatments for pregnant women. Substances listed in the Secret Catalogue of Medicaments must not as a rule be publicly advertised.

Recommendations and testimonials can be used only with the express written consent of the person in question and must take the form of a precise, dated, personal statement. Testimonials for which compensation of any sort is given or promised cannot be published. A recommendation that takes the form of advice may be published or mentioned only if the author is a professionally qualified scientist and specialist, and in such cases a precise personal statement must be obtained. The testimonials of specialists must be clearly separated from those of laymen in the advertisement. Of great significance is the stipulation that, if any passage from the literature is cited in the advertising, there must be no confusion as to whether such citation "relates to the general topic or is a specific reference to the substance in question."

A special administrative board has been formed which exercises control over all medical advertising. This board may impose further restrictions on the advertising of certain substances or of the treatment of certain diseases and on the form of propaganda employed with special relation to the display of laymen's testimonials. Any advertisement may be submitted to a competent authority for approval before permission to publish is granted. The board may forbid wholly or in part whatever it considers out of harmony with the law.

All these regulations become effective August 1. Violators are liable to fines not to exceed 150 reichsmarks and to imprisonment. The new legislation certainly represents a great step forward. Many abuses in the field of medical advertising will doubtless be removed. A perusal of the advertisement sections of the professional medical journals will convince any one of the deterioration that medical advertising has undergone in recent years. All too frequently one runs across medical advertisements in which the ingredients of a product are either inadequately described or, what is more common, not described at all. And this omission is usually accompanied by the most extravagant claims of therapeutic efficacy. The advertising of certain substances and firms which was formerly and with good reason denied space in the columns of reputable medical journals has somehow obtained entrée and frequently assumes a most obtrusive form. Since it is generally known that even doctors may be completely taken in by the psychologic appeal of clever advertising propaganda of medicaments, the new legislation is calculated to effect a drastic purgation of the professional as well as the popular mediums.

Reform of Pharmacy Under the Third Reich

The government has undertaken an incisive intervention in the activities of pharmacists and pharmacies which parallels its attempt to regulate all other fields of public health service. Some time ago new legislation with regard to examinations was instituted, by which the course of university training for pharmacists was increased to six semesters. Prospective pharmacists now receive a wider scientific background and a greater opportunity for postgraduate study and accordingly will be better able to meet the more exacting demands of present-day research and practice. These reforms were indeed timely. Large numbers of pharmacists have long been unemployed and two remedial measures had been calculated to aid them: first, admittance to the courses for career pharmacists was temporarily stopped and, second, the employment in pharmacies of so-called women assistants (helferinnen), or at least the performance of pharmaceutic duties by such women, was prohibited. Formerly, while well over a thousand trained pharmacists were unemployed, many female assistants ignorant of pharmacy were able to obtain jobs and these women worked for half the stipend of a pharmaceutically trained employee. But such assistants could act only in purely mechanical capacities and hence were considered as salespersons.

Female assistants can now function only as bookkeepers and cashiers. After the new law went into effect the number of unemployed pharmacists rapidly decreased. The closing of professional study to prospective students was later mitigated by the installation of a numerus clausus; but still only 350 pharmacists, some 5 per cent of the total number, have the right to train a praktikant. (Praktikanten are pharmacy apprentices; each prospective pharmacist must prior to beginning his university training have worked for a certain time as a praktikant; if he is unable to do so because of the numerus clausus, he will not be permitted to begin his studies.) This quota represents specifically the maximal number of the new generation who can hope in the future, in view of the existing demand for approved pharmacists, to find the opportunity to make a living in the profession within a certain time.

Noteworthy innovations also were effected with regard to the licensing of pharmacies; without a permit in due form no new pharmacy can be opened or an existing shop continue to do business. Such licenses are not granted non-Aryan pharmacists and this law applies to the entire reich. It is no longer possible for any non-Aryan to acquire an apothecary shop. But the provisions of the more recent legislation go even further: there are clauses governing the renting and operation of public pharmacies according to which in case the pharmacist-proprietor is legally prevented from carrying on he must transfer the operation of the shop to a legally qualified pharmacist as lessee. The choice of a lessee is virtually free but is subject to the approval of the board of control. A pharmacist's widow, for example, can no longer install a pharmacist-manager, who thus would become the employee of an untrained woman. By the new national renting legislation the lessee is assured an independent status; he may now maintain his own stock in trade and keep his own accounts. A pharmacy must likewise be leased if, through the proprietorship of the incumbent, the normal purveyance of pharmaceutical supplies to the public is in any way endangered or if the pro-

prietor is unfit to carry on because of national or moral considerations or is hampered in the conduct of his business by the infirmities of age, insanity, drug addiction or some other permanent disability. Jews are specifically barred from the operation of pharmacies. Pharmacies the proprietors of which are Jews come under the "compulsory leasing clause." Accordingly, a Jew is in any case prevented from the operation of a pharmacy even if it is his own. As an official comment on the new legislation has it, "Jewry's last hold on the German pharmaceutical profession has herewith been broken."

BUDAPEST

(From Our Regular Correspondent)

July 1, 1936.

The Program of the Hungarian Cancer Committee

At the annual meeting of the Association of Scientific Societies of Hungarian Physicians, Prof. William Manninger read a paper about the campaign of the Hungarian cancer committee. Unfortunately the committee at present cannot hope to complete its program because the state cannot provide the funds that would be necessary. The financial condition of the state was responsible also for the fact that the state tumor hospital and research institute had to be closed.

The new cancer campaign mapped out by Professor Dollinger is much more modest, and the chief obstacle to its achievement is not the want of money but the want of knowledge of the cause of cancer. According to present knowledge, cancer is not the result of a single cause but the sum of many conditions. The Hungarian Cancer Committee is not prepared to carry forward a campaign of treatment. The aim of the committee is to offer means for the demonstration and criticizing of the individual's work and of the results achieved by various methods.

The Dollinger plan consists of four main points: 1. To keep functioning all those research institutes which are dealing with biologic problems. To build in all parts of the country subsidiary centers where intensive research will be done on the histology and physiology of cancer. The equipping and maintenance of the institute is the duty of the state and municipalities. Finally, to compile cancer statistics based on strictly scientific control. Almost all parish and village doctors have offered their services to fill out the statistical blanks. 2. The committee intends to provide the country hospitals with physicians versed in the treatment of cancer. The use of auxiliary methods of treatment, including radiation therapy, is impossible on account of the lack of radium and of funds to meet the costs. It is the task of the committee to provide funds. The committee will persuade the government to establish a central institute in Budapest equipped with all recognized means of treatment. This institute is to maintain a close link with the university and also with all physicians interested in the cancer problem. The committee will distribute free books to all physicians of the country to aid them in the recognition and treatment of cancer. A further task of the committee will be to arouse the government to establish in every county laboratories equipped for the early diagnosis of cancer and also for the treatment of cancer. A special cancer library, at present consisting of 1,700 volumes, is at the disposal of all those physicians who are interested. 3. The committee will give continuous publicity to the early treatment of cancer through lectures, films, leaflets, radio talks and traveling museums. 4. Industrial plants and factories working with materials known as capable of producing cancer are to be periodically examined by cancer experts. Professor Manninger finished with the statement that the Hungarian government made huge sacrifices to further a campaign against tuberculosis with the result that it has ceased to devastate the population. Cancer mortality approaches the tuberculosis mortality, so that there is cause for the state to make a substantial sacrifice also in this field.

The Treatment of Venereal Patients in Hungary

The treatment of venereal patients is done in Hungary partly in special dispensaries and partly through the general nursing service and the protection of mothers and infants. Cities are provided with special dispensaries, and the villages are allied with the institutions. The latter work is not yet completed. Dispensaries for venereal patients are organized in cooperation with cities, municipalities and the social insurance. Drugs are free. The dispensaries have modern equipment and are provided with specialists and nurses, and are supervised by the ministry of the interior. The ministry contributes to the maintenance and to the establishment of dispensaries. The organization of new dispensaries is done by a committee consisting of representatives of the ministry of the interior, the social insurance institute and the ministerial commissioner for the prevention of venereal diseases. At present there are fifteen dispensaries in the country and there will be twenty by the end of the year. The number in attendances at the dispensaries amounts to 200,000 a year. The dispensaries are entrusted also with the periodic examination of prostitutes.

AUSTRALIA

(From Our Regular Correspondent)

June 30, 1936.

The Future of Medical Practice

In his presidential address before the Section of Medical Science and National Health at the last meeting of the Australian and New Zealand Association for the Advancement of Science, held in Melbourne, Dr. J. V. Duhig pointed out in no uncertain terms the weak points in the medicopolitical armor in Australia today. Medicine lays tribute on all the sciences for the promotion of human welfare and the study of human biology in all its manifestations—the structure, development, function and behavior of the body from its primordial conception to maturity and death. The maintenance of health involves a wide view of the human environment, and this view of the functions of medicine necessarily includes a knowledge of man's mental processes and the springs of his behavior. A government which is content to reflect public opinion results in a low state of social culture, and a high one requires a highly advanced, expert, well ordered intelligence ready to lead and to submit to rational restraints and disciplines. In Australia today the tendency of the central government is toward fascism, while in some of the states a thinly veiled communism is enforced. These antidemocratic tendencies are theoretically the trend of the elected representation but in actual fact are the evolved function of the vast bureaucracy of government servants. If science were fully in control of affairs there would be at least a foundation of knowledge and training, a systematic plan and way of approach to an attack on human problems, and above all a spirit of self criticism, moral integrity and the peculiarly refined feeling for truth and accuracy inseparable from good science.

Medicine in the past has failed to have any but a temporary, feeble effect on political theory and practice. Statesmen have seen political possibilities in some features of medical work and used them irrespective of their immediate effect on public development, to bribe the electorate into tranquillity now and good will at a future election. The insurance act in Great Britain was of this kind and was typical of Lloyd George's methods—it degraded both people and doctor and completely checked the sound evolution of medicine and social science. This casual empiricism based on a narrow, partial view of the functions of the greatest profession cannot be checked, however, until medicine can control its own destiny; and this control obviously cannot be acquired by mere scientific output but by control of the distribution of its benefits and general application; that is, medicine must eventually include, as must

science generally, training in political methods. By lack of political sense, and for other reasons, medicine has not yet made its full contribution to sociology. The traditional reticence of the profession was manipulated to hide the process of transfer of responsibility from doctor to bureaucrat. What above all the public wants, and should be told, is a statement of medical policy—what doctors are up to and what they are after. Only very childish people are completely satisfied to be told constantly that their doctors are concerned with human welfare and that all is for the best, and to be told nothing more. That sort of empty patronizing paternalism is only exasperating. Nationalization of medicine in the sense understood and practiced in Russia and partially practiced in England will eventually be disastrous—in comparison, that is, with what might be secured.

THE FUTURE OF MEDICAL PRACTICE

Duhig cannot see that any plan of medical service can give the fullest results that leaves out of account the value of private practice, which promotes the growth of a confidential relationship based on mutual trust and sound human interest. The first duty of the doctor is not to treat disease but to cure sick people and to prevent them from falling ill, and the prime requisites in this relationship are care and courtesy on the part of the doctor, and frankness and trust on the patient's part. A relationship of this kind of long standing and extending to all the units of a given family gains enormously in effectiveness, since the doctor works with precision on a very familiar background. No system possible can replace this one of sympathy, trust and understanding. Wherever nationalization has been tried it has failed in two ways—deterioration of the quality of the state-employed doctor, and tendency to development of a purely mechanical relationship. The evils of such a system are obvious. There are more subtle dangers. They are the encroachments made by slow pressure of a fairly enlightened public opinion acting on a profession so preoccupied with immediate tasks that it has been blind to the drift of things. Free or state subsidized services, such as school inspection, maternal and child welfare, dental treatment, diphtheria immunization, vaccination, psychoanalysis, nutrition and regulation of fertility, could and should be part of a private practitioner service; but since the profession was unwilling or unable to provide it as part of their system, they can only blame themselves for allowing it to go out of their hands into the control of interested nonmedical sociologists. If this kind of drift becomes general, nationalization will develop automatically, and there are medical men today who find it so hard to maintain the high social standards expected from self-respecting doctors that they would welcome the prospect of a steady, though reduced, income from the state. This would end in deterioration. The remedy would be to restore the doctor to a greatly expanded function. The most serious rival to the private doctor is the large public hospital, to some extent greatly overgrown beyond the real demand for such service. A million pounds in bricks, brass and white enamel is a marvelous advertisement for a vote hunter. Half the money now spent in this way might successfully be devoted to an inquiry as to why and how people get sick. The vast propaganda devoted to hospitals encourages the use of them and a slackness of self discipline of the kind that would encourage people to look after themselves and cultivate habits that will avoid illness. There occur many leaks of human beings away from health in a congenial, gainful occupation, into the indolence and spurious invalidism of a hospital bed, or a chronic seat in an outpatient department. A cynical humorist might have some excuse for making hospitals so unattractive that people would want to keep out of them.

The anachronism of honorary medical service to hospitals helps to keep the hospital population high. Charity should be unnecessary; it presupposes the existence of miserable helpless people who should not exist at all as such.

People must know, though they try to forget, that sickness and accident are just as inevitable as death and hunger and thirst, and should be provided for. The fact that medical service was provided free in feudal times to serfs is no argument for doing the same for free men in a democracy. The form of insurance that ought to be envisaged is precisely that which prudent men use today. The sort of insurance favored by Dr. Duhig is that which places the insured in possession of money to pay his accounts when he needs it. The only plan eventually worth considering is that of free choice of doctor by patient, and payment directly by the patient to the doctor, either out of savings or as a draft on a policy against sickness.

ITALY

(From Our Regular Correspondent)

July 1, 1936.

Early Diagnosis of Tuberculosis

The Federazione per la lotta contro la tubercolosi met recently in Palermo, under the chairmanship of Dr. Giufrè. The topic discussed was the early diagnosis of tuberculosis. Dr. Bompiani spoke on tuberculosis of the female genital organs, the diagnosis of which in childhood is rather presumptive. Tuberculous ascites and tuberculosis with impaired intestinal functions are the two forms most frequently found at early ages. The diagnosis of peritoneal localization of the disease is usually made. At puberty, delay in the appearance of menstruation and the presence of oligomenorrhea or dysmenorrhea are frequent. In some cases amenorrhea persists through youth and maturity and there are functional disturbances, pain in the lower part of the abdomen and sterility. Calandra spoke on the early diagnosis of tuberculosis of the neck of the femur, giving the anatomic reasons that account for the frequency of this form of tuberculosis in children from 2 to 10 years of age and for the rare occurrence of the disease in adults. Tuberculosis of the femoral neck may be located at any of the different zones of the neck and may be of a form either asymptomatic or painful. The disease frequently extends to the hip joint. The speaker detailed the technic of his surgical treatment, which is based on the perforation of the bone at the tuberculous focus. Pavone spoke on early diagnosis of renal tuberculosis. The speaker regards cystoscopy, meatoscopy and especially the functional test of each kidney of more diagnostic value than the other methods.

Society Reunion

The Latin Section of the Società di Gastroenterologia of Rome met recently at that city under the chairmanship of Cesare Frugoni, professor of clinical medicine. Dr. Muro spoke on intestinal trichomoniasis. He said that Trichomonas hominis may be found in the stomach of man as well as in the cecum and colon and that in certain cases it is pathogenic. The most frequent clinical picture is that of chronic enterocolitis, the main symptom of which is the irregularity of intestinal evacuation. In order to detect the parasite in the feces it is advisable to examine the feces immediately after evacuation. If there are a few parasites, fecal cultures can be prepared for examination. According to the speaker, the treatment of the infestation consists in the administration of enemas prepared with chiniofon and the administration of vioform by mouth.

Institution for Correction of Facial Deformities

An institution for the correction of facial deformities, either congenital or traumatic, from war or industrial accidents, was recently opened in Milan. There are now thirty beds, and forty more beds are in preparation. Persons with facial deformities from war are given the preference over any other applicants for admission.

Marriages

HENRY FRANKLIN DE WOLF, Little Rock, Ark., to Miss Helen Lawton Clarke in Estill, S. C., recently.

ROBERT COOPER BYRNE, Hatfield, Mass., to Miss Ethel Irene Redman of Franklin, N. H., August 1.

MICHAEL J. O'CONNOR, Spokane, Wash., to Miss Chonita Bovet of San Mateo, Calif., June 6.

BENJAMIN JOSEPH ROSENTHAL to DR. ELIZABETH WILEN, both of Brooklyn, August 9.

WILLIAM M. DAVIDSON, Seattle, to Miss Harriet Shipman of Montclair, N. J., June 27.

THOMAS P. FOLTZ, to Miss Eleanor Stuart Albers, both of Fort Smith, Ark., July 15.

E. ALEXANDER SCOTT, St. James, Mo., to Miss Nancy Elaine Honea of Rolla, June 14.

DAVID E. ENGLE, Martinsville, Ind., to Miss Faith Ritz of Royal Center, June 8.

ROSS E. MAYNARD to Miss Marjorie Lovejoy, both of Pine Bluff, Ark., June 16.

HAROLD SHELLOW to Miss Vivian Inez Van Ronkel, both of Chicago, July 8.

Deaths

John **Tilden Burrus** ✠ High Point, N. C.; North Carolina Medical College, Davidson, 1898; Chattanooga (Tenn.) Medical College, 1903; past president of the North Carolina State Board of Health and the Medical Society of the State of North Carolina; formerly visiting lecturer in clinical surgery, Duke University School of Medicine, Durham; fellow of the American College of Surgeons; served during the World War; at one time member of the state legislature; chief of staff and head of the department of surgery, Randolph Hospital, Asheboro; surgeon to the Davidson Hospital, Lexington, Thomasville (N. C.) Baptist Orphanage and the North Carolina Public Service Company; chief surgeon to the High Point, Thomasville and Denton Railroad; consulting surgeon to the Southern Railway; formerly member of the governing board of the state hospital for the insane, Morganton; aged 58; owner of the Burrus Clinic and chief of staff of a hospital bearing his name, where he died, June 8, of coronary thrombosis and hypertension.

Sidney Kohn Simon ✠ New Orleans; Tulane University of Louisiana Medical Department, New Orleans, 1903; specialist in internal medicine with special attention to gastroenterology; in 1922 a member of the House of Delegates of the American Medical Association, and from 1922 to 1924 secretary of the Section on Gastro-Enterology and Proctology, and chairman from 1925 to 1926; assistant professor of clinical medicine at his alma mater, and professor of gastro-enterology at the Tulane University Graduate School of Medicine; past president of the American Society of Tropical Medicine; member of the American Gastro-Enterological Association; fellow of the American College of Physicians; chief of the department of gastro-enterology, Touro Infirmary; aged 58; died, August 5.

Herman Bennett Slotkin ✠ Philadelphia; Jefferson Medical College of Philadelphia, 1925; member of the American Academy of Ophthalmology and Oto-Laryngology; instructor in neuro-otology at the University of Pennsylvania Graduate School of Medicine; assistant neuro-otologist at the Graduate Hospital of the University of Pennsylvania; served in the Medical Corps, chemical warfare division, during the World War; assistant otolaryngologist to the Jewish Hospital; aged 37; died, August 1, in the Manhattan General Hospital, New York, following a thoracoplasty.

Clarence Anderson Patten ✠ Philadelphia; Jefferson Medical College of Philadelphia, 1916; professor of neurology and vice dean for neurology and psychiatry at the University of Pennsylvania Graduate School of Medicine; member of the American Neurological Association, American Psychiatric Association and the Association for Research in Nervous and Mental Disease; served during the World War; neurologist to the Philadelphia General, Lankenau and Orthopedic hospitals; associate editor of "Cyclopedia of Medicine"; aged 46; died, June 2.

Herbert de Grove Sherman, White Plains, N. Y.; New York Homeopathic Medical College and Flower Hospital, 1915; member of the Connecticut State Medical Society and the Associated Anesthetists of the United States and Canada; served during the World War; roentgenologist to the Greenwich (Conn.) Hospital; aged 46; died, June 18, in the Grasslands Hospital, Valhalla, of subacute bacterial endocarditis and bronchopneumonia.

Edward Gilmer Thompson ✠ Memphis, Tenn.; University of Pennsylvania School of Medicine, Philadelphia, 1911; associate professor of medicine, University of Tennessee College of Medicine; served during the World War; fellow of the American College of Physicians; member of the staffs of the Methodist and John Gaston Memorial hospitals, and the Illinois Central Railway System; aged 51; died, June 21, of acute myocardial insufficiency.

Alquin Jay Davis ✠ Farmingdale, N. Y.; University of Pennsylvania School of Medicine, Philadelphia, 1909; president of the New York State Association of Sanatorium Superintendents and Boards of Managers; on the consulting staffs of the Nassau Hospital, Mineola and the Meadowbrook Hospital, Hempstead; aged 48; superintendent of the Nassau County Sanatorium, where he died, June 18, of pneumonia.

Charles Louis Upton ✠ Greenfield, Mass.; University of Pennsylvania Department of Medicine, Philadelphia, 1896; served during the World War; at one time member of the school committee of Shelburne Falls; on the staffs of the Farren Memorial Hospital, Montague City, the Franklin County Public Hospital and the Greenfield Isolation Hospital; aged 65; died, May 25, of chronic nephritis and myocarditis.

Evan Styles Potter, New York; University of the City of New York Medical Department, 1891; formerly medical expert to the law department of the city and medical examiner to the Civil Service Commission; on the staffs of the Columbus Hospital and the West Side Hospital; aged 66; died, May 26, in the New York Post-Graduate Medical School and Hospital.

Jacob Frank ✠ Chicago; University of Buffalo School of Medicine, 1882; past president of the Chicago Medical Society and the Chicago Surgical Society; retired colonel, Illinois National Guard; served during the World War; consulting surgeon to the Grant and Columbus hospitals; formerly surgeon to St. Elizabeth's Hospital; aged 80; died, August 11.

Walter Monroe Matthews Jr., Little Rock, Ark.; University of Arkansas School of Medicine, 1915; member of the Arkansas Medical Society; chief medical officer for the Little Rock regional office of the Veterans Administration; served during the World War; aged 47; died, May 2, in the Fitzsimons General Hospital, Denver, of tuberculosis.

Earl Henry Lormor ✠ Buffalo; University of Buffalo School of Medicine, 1914; served during the World War; aged 47; served in various capacities on the staffs of the City Hospital, Buffalo State Hospital, Millard Fillmore Hospital and the Buffalo General Hospital, where he died, May 25, of ruptured diverticulitis of the sigmoid.

James Finley Bell, Englewood, N. J.; University of the City of New York Medical Department, 1883; member of the Medical Society of New Jersey; past president of the Bergen County Medical Society; on the staff of the Englewood Hospital; aged 76; died, June 16, of cardiovascular disease.

Frank Eugene Haskins ✠ Boston; Tufts College Medical School, Boston, 1903; professor of pharmacology at his alma mater and formerly secretary of Tufts Medical College and Dental School; member of the Associated Anesthetists of the United States and Canada; aged 61; died, May 24.

John L. Kirkpatrick, Los Angeles; University of Southern California College of Medicine, Los Angeles, 1899; member of the California Medical Association; on the staff of the Queen of Angels Hospital and the Los Angeles General Hospital; aged 61; died, May 17, of carcinoma of the liver.

Michael Angelo Bailey, Hartford, Conn.; College of Physicians and Surgeons, Baltimore, 1893; member of the Connecticut State Medical Society; formerly member of the board of education; was connected with St. Francis Hospital in various capacities; aged 77; died, June 6.

Helen Cooley Palmer, San Marino, Calif.; New York Medical College and Hospital for Women, 1895; at one time professor of ophthalmology and associate professor of gynecology at her alma mater; aged 77; died, May 19, of cardiac rupture and coronary sclerosis.

John A. Roth, Red Hill, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1876; member of the Medical Society of the State of Pennsylvania; for many years a member of the board of education; aged 82; died, May 19, of carcinoma of the stomach.

Arthur Charles Dana, Fond du Lac, Wis.; Milwaukee Medical College, 1911; served during the World War; formerly city physician and health officer; aged 49; on the associate staff of St. Agnes Hospital, where he died, May 25, of cholecystitis and chronic myocarditis.

James Sherman Mosher, Williamsport, Pa.; College of Physicians and Surgeons, Baltimore, 1891; member of the Medical Society of the State of Pennsylvania; served during the World War; aged 69; died, May 10, in Pittsburgh, of cerebral hemorrhage.

Ward Lafayette King, Muncy, Pa.; College of Physicians and Surgeons, Baltimore, 1880; member of the Medical Society of the State of Pennsylvania; aged 80; on the staff of the Muncy Valley Hospital, where he died, May 24, of chronic myocarditis.

Ezra Clark Chase, Plymouth, N. H.; Eclectic Medical College of Maine, Lewiston, Maine, 1884; member of the New Hampshire Medical Society; on the staff of the Emily Balch and Soldiers and Sailors Memorial Hospital; aged 78; died, May 25.

Franklin K. Martin, Havana, Ill.; Eclectic Medical Institute, Cincinnati, 1882; member of the Illinois State Medical Society; aged 74; died, May 17, in the Methodist Hospital, Peoria, of carcinoma of the gallbladder and liver.

James Lewis Lee, Pinehurst, Ga.; University of Georgia Medical Department, Augusta, 1899; served during the World War; aged 57; died, May 16, in the Veterans Administration Facility, Atlanta, of cardiorenal vascular disease.

Charles Edward Webb, ⊕ Natchitoches, La.; Tulane University of Louisiana School of Medicine, New Orleans, 1930; on the staff of the Natchitoches Hospital; aged 38; died, May 24, in Jennings, of carcinoma of the stomach.

Emerson Augustus Ludden, North Brookfield, Mass.; Albany (N. Y.) Medical College, 1888; member of the Massachusetts Medical Society; for many years local health officer and school physician; aged 74; died, May 31.

William Chenitz, Newark, N. J.; University of Maryland School of Medicine, Baltimore, 1930; member of the Medical Society of New Jersey; aged 32; died, May 17, in the Beth Israel Hospital, of carcinoma of the stomach.

Edward Emery Baumeister, San Francisco; University of California Medical Department, San Francisco, 1904; member of the California Medical Association; fellow of the American College of Surgeons; aged 59; died, May 4.

Alfred Joseph Jackson, Hempstead, N. Y.; Howard University College of Medicine, Washington, D. C., 1927; member of the Medical Society of the State of New York; aged 37; died, May 12, of rheumatic heart disease.

Howard Lansing Waldo, Flushing, N. Y.; Regents of University of State of New York, 1875; member of the Medical Society of the State of New York; aged 83; died, May 7, of arteriosclerosis and chronic endocarditis.

Stanislas Martel, Boston; School of Medicine and Surgery of Montreal, Que., Canada, 1893; member of the Massachusetts Medical Society; on the staff of the Lynn (Mass.) Hospital; aged 65; died, May 16, of pneumonia.

John W. Good, Fordland, Mo.; St. Louis College of Physicians and Surgeons, 1897; member of the Missouri State Medical Association; county coroner; local registrar of vital statistics; aged 75; died, May 11.

William E. Royster, Chanute, Kan.; Louisville (Ky.) Medical College, 1907; member of the Kansas Medical Society; on the staff of the Johnson Hospital; aged 66; died, May 31, of a self inflicted bullet wound.

Henry B. Golden, Philadelphia; University of Pennsylvania Department of Medicine, Philadelphia, 1896; aged 62; died, May 20, in the Philadelphia General Hospital, of myocarditis and benign prostatic hypertrophy.

Arthur P. Hunnemann, Chicago; Harvey Medical College, Chicago, 1903; formerly on the staff of the Illinois Eye and Ear Infirmary; aged 66; died, May 20, of carcinoma of the bladder with metastases.

Frederick Jesse Weld, Rockford, Ill.; Rush Medical College, Chicago, 1884; member of the Illinois State Medical Society; aged 76; died, May 24, in St. Anthony's Hospital, of cerebral hemorrhage.

Joel Grosner, Jersey City, N. J.; Cornell University Medical College, New York, 1899; aged 58; died, May 23, in the Veterans Administration Facility, Lyons, of chronic myocarditis and arteriosclerosis.

James Martin, Magnolia, Del.; Medico-Chirurgical College of Philadelphia, 1893; member of the Medical Society of Delaware; past president of the Kent County Medical Society; aged 69; died, May 24.

William Patrick Kenealy, Washington, D. C.; Georgetown University School of Medicine, Washington, 1915; also a druggist; aged 63; died, May 25, in the Sibley Hospital, of brain tumor.

James Harvey Ferguson, Kempton, Ind.; Medical College of Indiana, Indianapolis, 1902; aged 66; died, May 12, in St. Vincent's Hospital, Indianapolis, of angina pectoris and coronary embolism.

Wilber T. Kennedy, Johnson City, Tenn.; Tennessee Medical College, 1905; member of the Tennessee State Medical Association; aged 57; died, April 7, of carcinoma of the prostate.

Harry Bell Nunnally ⊕ Monroe, Ga.; Atlanta College of Physicians and Surgeons, 1906; on the staff of the Walton County Hospital; aged 53; died, May 13, of cardiac asthma.

Charles L. La Barge, St. Louis; St. Louis Medical College, 1874; for many years diagnostician for the city health department; aged 85; died, May 9, of angina pectoris.

John Ferguson Hope, Drexel Hill, Pa.; Jefferson Medical College of Philadelphia, 1904; aged 53; died, May 21, in the Delaware County Hospital, of coronary occlusion.

Bessie James Garver, Los Angeles; State University of Iowa College of Medicine, Iowa City, 1890; aged 82; died, May 10, of hypostatic pneumonia and senile dementia.

Raymond Nathaniel Jackson, Brunswick, Ga.; Meharry Medical College, Nashville, Tenn., 1905; aged 52; died, May 11, of myocarditis and interstitial nephritis.

Walter Witmore Senn, Williamsport, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1907; aged 55; died suddenly, May 15, acute nephritis.

Malcolm J. Mooney, Quebec, Que., Canada; McGill University Faculty of Medicine, Montreal, 1898; aged 63; died, May 25, in Tokyo, Japan, of pneumonia.

Claude Nicholson Lacey ⊕ Demopolis, Ala.; University of Alabama Medical Department, Mobile, 1900; aged 57; died, May 17, of a self inflicted bullet wound.

John Mackenzie ⊕ Reese, Mich.; Detroit College of Medicine, 1893; aged 73; died, May 19, in St. Mary's Hospital, Saginaw, of cerebral hemorrhage.

Marshall Dwight Jennings, St. Louis; St. Louis College of Physicians and Surgeons, 1888; aged 75; died, May 18, of carcinoma of the rectum.

Albert Henry Daniel Heppner, Los Angeles; Long Island College Hospital, Brooklyn, 1897; aged 73; died, May 10, of cirrhosis of the liver.

Henry M. Ammond, West Branch, Mich.; Jefferson Medical College of Philadelphia, 1882; aged 81; died, May 30, of cerebral hemorrhage.

Orris E. Lett, Montgomery, Ind.; Kentucky School of Medicine, Louisville, 1901; formerly county coroner; aged 65; died, April 12.

William A. Longanecker, Los Angeles; Jefferson Medical College of Philadelphia, 1876; aged 87; died, April 3, of chronic myocarditis.

Frank Ward Lynch, El Paso, Texas; Medico-Chirurgical College of Philadelphia, 1910; aged 57; died, April 1, of cerebral hemorrhage.

Herbert D. Jenckes, Pipestone, Minn.; College of Physicians and Surgeons of Chicago, 1884; aged 82; died in May of carcinoma.

Frank Jacob Sofge, Cincinnati; Medical College of Ohio, Cincinnati, 1904; also a pharmacist; aged 67; died suddenly, April 21.

Hugh Angus McColl, Milton, Ont., Canada; University of Toronto Faculty of Medicine, 1389; died, May 14, of heart disease.

Joseph L. Mackey, Charleston, Tenn.; Hospital College of Medicine, Louisville, Ky., 1890; aged 75; died, April 5.

Henry H. Gambill, Blaine, Ky.; Atlanta Medical College, 1895; formerly bank president; aged 62; died, May 9.

Charles A. Strasburg, Cridersville, Ohio; Pulte Medical College, Cincinnati, 1903; aged 74; died in April.

Alfred Edwards, St. Louis; Dallas Medical College, Dallas, Texas, 1904; aged 78; died, May 7, in Reno, Nev.

Oscar A. Hubbs, Butler, Ohio; Pulte Medical College, Cincinnati, 1879; aged 85; died, May 1.

Bureau of Investigation

PARANA MATÉ AND PYLAIDES
A South American Tea and a "Pile Cure" Declared Fraudulent

"Parana Maté" was the proprietary name employed by the Rundle-Murphy Company of Westport, Conn., for one of the innumerable brands of yerba maté, or Paraguay tea, that have flooded the North American market during the last several years.

Parana Maté was exploited as an invigorating beverage of amazing medicinal value for nervous ailments, convalescents, anemics, and of especial value for tired business men and women.

A romantic historical background was skilfully woven into the advertising of Parana Maté. The tea was alleged to have been discovered several hundred years ago by missionaries to South America. The Spanish grandees, it was said, were "not slow in becoming acquainted with the almost miraculous powers of the infusion drunk by the Indians . . . Maté does not directly affect the nerve system as do coffee and tea, but rather localizes its action in the muscular system and Vital Organs." Yet, paradoxically, it was also claimed to "Regenerate lost Nerve Force! Build up strong, sound nerves through natural methods." The unique process by which maté built up strong nerves without affecting them was left to the imagination.

Among the other amazing accomplishments claimed for Parana Maté was its ability to prevent hunger, which, according to the exploiters, made the tea eligible for combating obesity.

According to the directions, Parana Maté was to be brewed into a tea, one "heaping teaspoonful of Maté for each cup wanted and one extra for the pot." The drinking of "four or five cups a day" was advocated by the promoters.

The government's chemical analysis of Parana Maté, "the Fountain of Youth," showed that the only active ingredient was caffeine, of between ½ and ¾ grain per cup, which is slightly less than that contained in a cup of tea or coffee. "In addition, small quantities of chlorophyll and tannin were also present in insignificant amounts."

The Post Office authorities held that Parana Maté had no more healing properties than tea or coffee, that the drinking of four or five cups daily as directed might be harmful in the case of children and aged persons, and that the beverage would not afford "relief from tropical fevers and other body, as well as mental ailments." The report further stated that inasmuch as Parana Maté had no value as a food, it would not "prevent hunger" and accordingly would be of no assistance in combating obesity.

In addition, the concern sold through the mails a product, "Pylaides," for the cure of hemorrhoids. The exploiters advertised it as a "soluble suppository," claiming that "this formula was prepared by one of America's foremost specialists," going on to name a former professor of the New York Post Graduate School, who, the records show, died as long ago as 1917. The government chemists reported that Pylaides consisted essentially of ichthyol, cannabis Americana and the alkaloid hydrastin, in a base of cacao butter. The report pointed out the danger in the absorption of cannabis Americana in the system and the likelihood of its forming "a pernicious habit causing great injury to the user," although the promoters of Pylaides represented the mixture as a safe treatment. The report showed, further, that this nostrum would have no remedial effect whatever in the treatment of hemorrhoids.

According to the government report, the promoters were cited in August 1934 to show cause why a fraud order should not be issued against the names then used in the conduct of the enterprise. The concern at that time "agreed to discontinue the scheme and never to resume it." However, the resumption of the enterprise brought about the recommendation of Post Office Solicitor Karl A. Crowley that a fraud order be issued against the Rundle-Murphy Company, Importers; the Rundle-Murphy Company, and their officers and agents. On evidence satisfactory to him, the Postmaster General on June 9, 1936, closed the United States mails to the concern and parties above mentioned.

Correspondence

LONG'S CONTRIBUTION TO DISCOVERY OF ETHER

To the Editor:—In different papers concerning the discovery of ether anesthesia by Crawford W. Long it has been stated that one of the reasons Long was seeking an anesthetic was to relieve women of the pains of childbirth.

Some time ago Dr. Joseph B. De Lee wrote me asking if I knew the date of Dr. Long's first administration of ether in childbirth. For the past several months I have been investigating this matter with some of the members of Dr. Long's family, and I now find out that on Dec. 27, 1845, Dr. Long used ether in delivering his own second child, born at Jefferson, Ga. This date is attested by the family Bible record now in possession of Mrs. Eugenia Long Harper, Gay, Ga., sole surviving child of Crawford Long. Mrs. Harper tells me that the family often heard their mother say that Dr. Long administered ether to her when this child was born.

We read in the Encyclopedia Brittanica that Sir James Y. Simpson used ether in obstetrics in 1846 and was the first to use chloroform in 1847. If these dates are correct, Crawford Long not only used ether anesthesia in the first surgical operation (March 30, 1842) but also was the first to use an anesthetic in obstetrics, Dec. 27, 1845.

F. K. BOLAND, M.D., Atlanta, Ga.
President, Crawford W. Long Memorial Association.

HEMOLYTIC SHOCK FOLLOWING BLOOD TRANSFUSION

To the Editor:—The subject of hemolytic shock following blood transfusion is again arousing interest, owing partly to the publication of studies by Professor Hesse and his associates in Leningrad, whose work was reviewed editorially in THE JOURNAL, June 27.

The clinical syndrome accompanying and following hemolysis in vivo in man is fairly well known. During or soon after transfusion the recipient becomes acutely ill with severe pains in the lumbar region, dyspnea and cyanosis, chills, fever and collapse. The blood serum contains free hemoglobin and the van den Bergh test gives an atypical biphasic reaction within two hours. If hemolysis is extensive, hemoglobin appears in the urine. Jaundice may be noted as early as eight hours after the transfusion. The acute phase of the reaction lasts only a couple of hours. Then the patient may recover promptly or signs of grave renal insufficiency may appear. In the latter case, anuria or oliguria quickly supervenes. The patient vomits frequently. There is progressive nitrogen retention and death in coma follows about ten days after the transfusion. Pathologic examination of the kidneys reveals necrosis of the tubular epithelium, interstitial polymorphonuclear infiltration, and masses of pigment derived from hemoglobin in the tubular lumens. The glomeruli appear normal. The picture is almost the same as, if not identical with, that seen in blackwater fever and in quinine hemolysis.

The most important phase of this problem is the effect of hemoglobinemia and hemoglobinuria on the kidney, which the Russian group ascribes primarily to the ischemia of the kidneys as the result of the vasoconstrictor action of hemoglobin. They advocate the transfusion of compatible blood or blood serum to treat the anuria. A critical analysis of their experimental work seems indicated.

Mason and Mann (*Am. J. Physiol.* **98**:181-185 [Sept.] 1931) obtained only transient vasoconstriction in the kidney of the dog and the frog after the intravenous injection of hemoglobin. In one dog 7.5 cc. of laked blood per kilogram produced only

temporary reduction in renal volume. Permanent anuria has been produced in man with smaller quantities of incompatible blood.

My colleagues and I have reproduced in dogs quite accurately the picture of renal insufficiency by the injection of hemolyzed blood into dogs with acid urines (THE JOURNAL, February 1, p. 416). The dogs develop oliguria or anuria and die in coma from the third to the tenth day after transfusion, with blood urea nitrogen values of from 119 to 350 mg. per hundred cubic centimeters. The kidneys show the typical nephropathy. This picture cannot be produced in dogs with alkaline urines.

The Russian workers have published similar experiments except that the reaction of the urine was not noted (Iljin: *Arch. f. klin. Chir.* **181**:240-249, 1934). Their dogs died within two days following transfusion, and the highest blood nonprotein nitrogen value obtained was 89 mg. per hundred cubic centimeters. No pathologic studies were reported. It is evident that this is not an accurate reproduction of the clinical syndrome of renal insufficiency following hemolysis.

The relation between urinary acidity and renal insufficiency from hemoglobinuria has been established by Yorke and Nauss (*Am. Trop. Med. & Parasitol.* **5**:287, 1911-1912) and Baker and Dodds (*Brit. J. Exper. Path.* **6**:247, 1925) in the rabbit and by us in the dog. A complete physiologic explanation of the effect of hemoglobin on the kidney ought to account for these facts.

ELMER L. DEGOWIN, M.D., Iowa City.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

TESTS FOR UREA AND RENAL FUNCTION

To the Editor:—Please describe the urea clearance test, the Van Slyke and Cope technic, also its clinical value and state normal and pathologic percentages; also kindly publish the method for carrying out the concentration test for renal function, the technic as described by Lashmet and Newburgh; also the urea ratio test as employed by Mosenthal, stating the range of the normal ratio. Please omit name. M.D., Minnesota.

ANSWER.—The blood urea clearance test is a test of renal efficiency based on the cubic centimeters of blood cleared of urea by the kidneys per minute.

The technic is usually the following:

1. At 8 a. m., breakfast without coffee or tea.
2. At 9 a. m., empty the bladder and discard the specimen. Give 100 cc. of water to drink.
3. At 9:50 a. m., obtain 5 cc. of venous blood for urea estimation.
4. At 10 a. m., collect a total specimen of urine. Give 100 cc. of water to drink.
5. At 11 a. m., collect another total specimen of urine.

Estimate the blood urea in milligrams of urea per hundred cubic centimeters. Measure the amount of each hourly specimen of urine. Calculate the volume excreted per minute for each hour period. Estimate the urine urea in milligrams per hundred cubic centimeters in each. If more than 2 cc. is excreted per minute, determine the maximum clearance *(Cm)*. If less than 2 cc. is excreted per minute, estimate the standard clearance *(Cs)*.

The percentage of average normal is $Cm = \frac{1.33 \times U \times V}{B}$

$$Cs = \frac{1.85 \times U \times \sqrt{V}}{B}$$

Cm. is the maximum clearance, *Cs* the standard clearance; U = milligrams of urea in 100 cc. of urine, B = milligrams of urea in 100 cc. of blood, and V = the volume of urine excreted per minute.

The results are expressed in percentage of the average normal, and less than 75 per cent may be considered pathologic. Early acute nephritis may show a normal urea clearance. In most cases it falls to 50 per cent of normal within the first few months. For a good prognosis the urea clearance figures should return to normal in four months. In arteriolosclerotic kidney disease the urea clearance is usually normal until near the terminal state, when it drops with the development of uremia. The blood urea nitrogen does not show an increase until the urea clearance diminishes to about 50 per cent of normal. The prognosis is bad when the urea clearance reaches 20 per cent of normal. Uremic symptoms are present with values of less than 5 per cent, and death occurs within a few days.

The test is a procedure requiring extensive and careful estimations and is thus comparatively expensive. When correctly done it reveals kidney function with a high degree of accuracy. For practical purposes a carefully conducted urine concentration test, a blood urea determination and examination of the urinary sediment are as sensitive an index of early renal damage as is the urea clearance test.

Van Slyke and Cope (*Proc. Soc. Exper. Biol. & Med.* **29**:1169 [May] 1932) have described a simplified colorimetric method for determination of the blood urea clearance.

The urea contents of urine and blood are compared in a colorimeter in such a manner that a single reading gives directly the percentage of average normal renal function in terms of the blood urea clearance. The urine is first diluted to such an extent that, if the clearance, either standard or maximum, is the average for a normal subject, the urea concentrations in blood and dilute urine will be equal. The urea in both blood and urine is converted into ammonia with urease; proteins and other interfering substances are removed, and the ammonia contents of the two filtrates are compared colorimetrically.

No standard solutions are required, because the blood is compared directly with the urine. The technic, with the necessary reagents, treatment of urine and blood, nesslerization and comparison of blood and urine filtrates, and the calculation will be found in the reference mentioned. The details are too lengthy to be given here.

The disproportionate elevation of the blood urea nitrogen may be resorted to as a test for renal function. Mosenthal and Hiller (The Relation of the Nonprotein Nitrogen to the Urea Nitrogen of the Blood (*J. Urol.* **1**:75 [Feb.] 1917) found that while the percentage of the urea nitrogen of the total nonprotein nitrogen in the blood in the presence of normal renal function is between 40 and 50 per cent, when kidney activity is reduced this rises to 80 or even 90 per cent. This holds true as an index of renal function whether the blood urea nitrogen is high or is reduced by diet. On the other hand, when the urea nitrogen of the blood drops because there is improvement in renal function, the percentage of the urea nitrogen of the total nonprotein nitrogen again assumes a normal level.

The urine concentration test is a test of the kidney's power to concentrate waste products removed from the blood. There is no serious renal impairment if the specific gravity of the urine can be elevated to 1.025 or over. If an ordinary urine specimen shows a specific gravity of 1.025 or higher, no further examination except for sugar and microscopic sediment need be done.

Lashmet and Newburgh described their method of performing the concentration test in THE JOURNAL, Oct. 22, 1932, p. 1396. The technic is as follows:

About 6 p. m. eat the usual supper, avoiding fluids of any kind, such as coffee, tea, milk or soup. Empty the bladder at bedtime and discard the specimen. On waking in the morning empty the bladder and save the urine in bottle 1. An hour later collect specimen 2, and two hours after this one collect number 3.

Take the specific gravity carefully of each specimen. Use only a high-grade urinometer. Examine the sediment carefully for casts, red blood cells or pus. If the specific gravity is 1.025 or less, give a dry diet for one day, examining the specimen passed on the following morning.

The dry diet should consist of:

Breakfast:	Cornflakes, ½ cup; bread (toast), 2 slices; butter, 2 squares; rich cream ¼ cup; sugar, 1 tablespoonful.
Lunch:	Beefsteak, 4 by 4 by ½ inch; one baked potato; crackers, 4; butter, 2 squares; dates, 10.
Dinner:	Baked potato, 1; lettuce, ¼ head; crackers, 4; butter, 2 squares; dates, 4; peaches (canned, no juice), ½.
	In addition to foregoing, 1 Gm. of salt only.

Collect the urine from 8 p. m. until 8 a. m. the following morning, on which no breakfast is taken. Get a second specimen at 10 a. m. and a third at 12 noon.

With this test normal kidneys are able to concentrate the urine to a specific gravity of 1.029 to 1.032. Many patients with essential hypertension will show 1.025 to 1.029. In chronic

nephritis, the maximum concentration decreases to as low as 1.010, the low figure occurring in the severe types. The maximum is usually 1.020 or less before the phenolsulfonphthalein is diminished. With heart failure the level is around 1.020.

SYMPTOMS POSSIBLY ASSOCIATED WITH ARSENICAL POISONING

To the Editor:—A white man, aged 65, single, worked in a store selling wall paper for twenty-nine years. During the last four years he has done nothing. He is of slender type, 6 feet 4 inches (193 cm.) tall, is fairly well nourished, and weighs 160 pounds (73 Kg.). He has lost the sensation of taste and smell. He complains of generalized weakness and insomnia; this is not constant but occurs at indefinite intervals. He feels shaky within, has no desire for food, and has a slimy taste in his mouth, with a disagreeable odor. These complaints have been occurring off and on for the last four years. The past history is essentially negative. The family history is negative. He does not indulge to excess in anything. He smokes and chews tobacco occasionally and drinks one or two glasses of whisky perhaps two or three days a week. The family condition is good, without financial worries. The patient never married. The skin is normal and has a pasty color. It was always this color. The eyes are normal. The patient wears glasses. There is no obstruction in the nose, and no discharge. He is partly edentulous. The remaining teeth have gold crowns. Roentgen examination has shown no devitalized or abscessed teeth. The tongue is slimy, with a brownish coating. The saliva is thick. The tonsils are present. The neck is normal. The chest is well developed and symmetrical. Expansion is equal on the two sides and there is no evidence of a pathologic condition. There are no murmurs. The heart has good tone and regular rhythm with a rate of 74 a minute. There is no palpitation. The abdomen is thin; there are no herniations or tenderness. The marginal lines are normal. The genitalia and the rectum are normal. The prostate is atrophied. Normal reflexes are present in the extremities. The patient has marked strength in the hands, arms and legs. He has a strong grip. There is no evidence of muscle atrophy or dystrophy. A gastro-intestinal and gallbladder study was negative. It showed good function. The urine is amber colored. The specific gravity ranges from 1.016 to 1.22. There are no casts or albumin. It is acid in reaction. Repeated Wassermann tests have been negative. The blood sugar is 95 mm. per hundred cubic centimeters. Red blood cells number 3,800,000; hemoglobin 80 per cent (Tallqvist); white blood cells 6,300, with 74 per cent polymorphonuclears, 22 per cent lymphocytes, 1 per cent basophils, 2 per cent nuclears and 1 per cent eosinophils. He has been treated with various of the barbital groups, valerian and chloral with little or no effect. For stomach stimulants he has received gentian, calumba, nux vomica and hydrochloric acid without effect. I would appreciate any information you may be able to give in the treatment of this patient.

J. A. MANCUSO, M.D., Meadville, Pa.

ANSWER.—At the age of 65 some of the dysfunctions described conceivably might be attributed to physiologic degenerative changes. In any person with twenty-nine years of exposure in selling wallpaper, a suspicion that arsenic poisoning may have existed is tenable. Arsenic poisoning is still arising from colors used in wallpaper printing. Exposure in a single room lately papered, if occupied before complete drying or under other circumstances of providing considerable moisture in the paper, may lead to arsenic poisoning. In this ex-wallpaper salesman, unexposed for the last four years, it is unlikely that active arsenic poisoning persists, so that any theory contemplating a diagnosis of earlier arsenic poisoning must consider present lesions as sequelae and probably uneradicable results from the earlier action of arsenic. It probably would be quite futile to attempt to recover arsenic from the hair of the head at this late time, or from any other tissues of the body. A more profitable line of endeavor may be found in very careful history taking as to obscure diseases of the past (that is, during the twenty-nine years of contact with wallpaper), seeking evidences of acute arsenic poisoning, such as attacks of headache not accounted for otherwise, eruptions and abnormal coloring of the skin, loss of nails and hair, warty growths on the skin, rhinorrhea, gastro-intestinal upsets, vomiting, diarrhea, abdominal pain (none accounted for through a plausible explanation) peripheral neuritis, excessive fatigability or muscular weakness. Further, the history inquiry should seek to establish the extent of contact with wallpaper and particularly exposure under conditions in which wallpaper was stored, in cellars or otherwise, where undue moisture was present. Arsenic is capable of bringing about a great variety of obscure lesions. It is not beyond reason to believe that possibly arsenic may have brought about minute fibrosis within the central nervous system, to the point of occasioning the loss of the special senses described.

This one suggested lead should not be investigated to the exclusion of all others. A careful examination at the hands of a highly skilled neurologist might disclose entirely different possibilities. Even though it became possible to accept arsenic poisoning as the proximate cause of the present condition, it is unlikely that any treatment may eradicate the insult to the tissues already established. Symptomatic treatment, such as for the gastro-intestinal disturbances, is the line of procedure likely to serve the patient's best interests.

TREATMENT OF SYPHILIS

To the Editor:—I should appreciate advice on the following problem: A man, aged 25, came to my office May 17, 1935, complaining that the hair on his legs was coming out. He had had no chancre and felt all right. I made a Wassermann test and it was 4 plus. I have given him a total of nine injections of mapharsen, eighteen of neoarsphenamine and thirty-six of a bismuth compound during a thirteen months period, according to the modified continuous system of therapy. May 13, 1936, the Wassermann reaction was negative. A spinal tap revealed 10 cells, globulin negative, Wassermann reaction negative. No differential was done. Will you be good enough to advise me as to future treatment?

FREDERICK B. DEVITT, M.D., Oneonta, N. Y.

ANSWER.—The cell count of 10 lymphocytes in the spinal fluid reaches the upper limit of normal and warrants further consideration even though the blood Wassermann reaction is negative.

It would seem advisable now to start giving the patient some rest periods from treatment. For example, as he has had no treatment since June 17, he should continue with the rest period until August 1 and then have a course of twelve injections of a bismuth compound at the rate of two a week. This should be followed by a rest period of two months and a repetition of the course of twelve injections of the bismuth compound. A blood Wassermann test should be done at this time and, if negative, two similar courses of a bismuth compound are to be given, with a six months rest interval between them. On the other hand, if the blood Wassermann reaction is found to be positive, a spinal fluid examination should again be made, because it has been shown that a relapse of the blood Wassermann reaction in a patient with early syphilis is usually associated with a positive spinal fluid test. Irrespective of whether or not the Wassermann reaction remains negative, the spinal fluid examination must be repeated because of the cell count of 10 lymphocytes before the patient is placed on observation. When these prescribed courses of bismuth preparations are completed and the serologic reaction is negative, the patient is placed on parole or observation. He should be urged to report for a physical examination and a Wassermann test at intervals of six months for the next two years and then once a year for the next three years. If at the end of this time the Wassermann and spinal fluid reactions are both negative, he is eligible for marriage and may then be classified as "cured." The physical examinations made during the parole period should consist of search not only for cardiovascular disease or signs of central nervous system involvement but also for signs of cutaneous or mucous membrane recurrences. The mucous membranes, genitalia and especially the posterior side of the scrotum should be reexamined at each visit.

EFFECTS OF DICHLOROBENZENE

To the Editor:—I am interested in whether or not a person can be harmed by dichlorobenzene. I have a patient who was overcome in a home being treated by a termite destroyer (dichlorobenzene). I saw her two days later, when she complained of nausea, shortness of breath and sleepiness. She continually yawned while in the office. Hospital laboratory work showed only a lowered carbon dioxide combining power of blood plasma 43 per cent. One week after being overcome she had a hematuria for two days. Two weeks has elapsed and she still complains of weakness and some shortness of breath and pain in the back between the scapulae. I have read the articles in THE JOURNAL of Oct. 13, 1934, and March 23, 1935. Any further information on this subject that would enable me to treat the patient more scientifically would be appreciated. The method used in destroying the termites is spraying of liquid under pressure into the wood.

JACOB P. NILL, M.D., Pennsylvania.

ANSWER.—Chlorobenzenes have been held responsible for a number of poisonings (Kemper, H.: Paradichlorobenzene, Insecticide Especially for Use in Houses, *Ztschr. f. Gesundhtech. u. Stadhyg.* **24**:291 [July-Dec.] 1932. Wybert, E.: Poisoning of a Child Two Years Old by Puran, Cleaning Fluid Containing Monochlorobenzene, *Schweiz. med. Wchnschr.* **64**:561 [June 16] 1934). On the other hand, dichlorobenzene has found some use in therapy (Bertucci, E. A.: Dichlorobenzene Terpene Compound Vapor in Hemoptysis, *New Orleans M. & S. J.* **84**:620 [Feb.] 1932). The chlorination of benzene lessens the toxicity of benzene itself. Although some variations in toxicity may arise, depending on the position of the introduction of the chlorine—that is, ortho, meta or para—the demarcation is not clear. Apparently the para position is associated with a greater toxicity, and it is this product which has enjoyed extensive use as a disinfectant and as a disinfestant. It is believed that the chlorinated benzenes assert a more active narcotic action than benzene and conversely are less destructive of the cellular elements of the blood. Some of the chlorinated benzenes are solids and are insoluble in water. This necessitates in some instances the use of solvents which themselves may be highly

toxic. Much of the literature centering about these compounds does not differentiate between the monochlorobenzene and the dichlorobenzene, nor is the position of the introduction of the chlorine often specified. Furthermore, the literature on this topic is confused through the fact that published articles refer without thorough definition to chlorinated compounds into which the nitro group has also been added. In spite of many opportunities for discrepancy, warrant appears to obtain for mentioning, as the chief manifestation of the action of chlorobenzenes, headache, dizziness, shortness of breath, cyanosis, hematuria and methemoglobinemia. The demonstrable lesions appear to occur chiefly in the blood, along the urinary tract and in the nervous system. In very acute poisoning, unconsciousness is characteristic. No treatment is well established for poisoning by chlorinated benzene. Various statements may be found indicating that the treatment is the same as for benzene poisoning. In the treatment of benzene poisoning, transfusions have been used, as well as heliotherapy, lecithin compounds and liver extracts. In the case of poisoning by chlorinated hydrocarbons in general, high calcium therapy has proved to be of some worth. In the very early stages, abstinence from alcohol is desirable.

REMOVAL OF SKIN STAINS

To the Editor:—I would appreciate it if you would give me some information concerning the removal of dark brown stains on the face following contact with some liquid. This patient does not know what it was, but it has the appearance of a sulfuric acid stain. The accident occurred March 28 and the stain on the skin did not appear until April 25. Can you give me any information with regard to removing a sulfuric acid stain? What is the likelihood of its being permanent? If this stain can be removed can your give me some idea as to length of time required? A patient's face was burned by an electric flash resulting from a short circuit of a 4,600 volt line. Obtundia cream was applied to the burn for several days. I understand that this cream contains phenol, camphor and aristol. I saw the patient seven weeks after the accident. At this time the skin was entirely healed and perfectly smooth. One half of the face which came in contact with the flash is stained a light brown. What is the prospect of permanence here and what would you suggest for its removal? Please omit name.

M.D., Massachusetts.

ANSWER.—Pigment formed in the skin may be either (1) iron-free melanin formed by the epithelial cells or (2) iron-containing pigment derived from the blood which has in some way escaped from the blood vessels into the tissues. Other kinds of pigment may be introduced into the skin from without or be carried to it by the blood.

A sulfuric acid burn destroys tissue, which is sloughed off, leaving, if superficial, smooth skin or, if deep, more or less scar. The area may be pigmented in either of the ways mentioned. Pigmentation beginning a month after the injury, however, is almost certainly of the first kind. This can be removed in certain cases, but when it is the result of an inflammatory reaction, as in this instance, it is often resistant and apt to recur after removal.

Bleaching may be tried. Perhydrol, a 30 per cent solution of hydrogen peroxide, may be used as follows: perhydrol, 2 cc.; wool fat, 12 Gm.; petrolatum, sufficient to make 20 Gm. Apply this to a small area once daily until an inflammatory reaction occurs, then stop it and wait for the dermatitis to subside. After this area is somewhat lighter, treat another in the same way. If there is no result, the ointment can be made stronger.

If more vigorous measures are necessary, carbon dioxide snow mixed with acetone may be tried. This allows a slight degree of freezing with less danger of causing a sharply defined spot, so hard to avoid when the pencil of snow is used.

The Jarisch bleach, ammoniated mercury, bismuth subnitrate and barium sulfide of each 1 part, ointment to 30 parts, may be spread on the area and allowed to remain over night. Strong applications are not advisable for fear of adding to the pigmentation. No definite length of time can be given; but cautious work will require several months at least, if the preliminary trial is satisfactory enough to warrant further treatment.

In pigmentation of the second kind the possibility of hematogenous pigment must be considered. If this is the case, nature will slowly remove it. More likely, as in case 1, the pigmentation is melanin and it is probable that efforts to remove it will not be successful. A trial of the remedies suggested for case 1 is in order, however. The patient is impatient, naturally, and the methods mentioned may be tried on a small area and, if successful, applied to the whole area.

"Obtundia cream" was mentioned in Queries and Minor Notes in THE JOURNAL, Feb. 11, 1933. It is thought to contain camphor and metacresol, which do not cause pigmentation. Its composition is unknown, however, and manufacturers of such nostrums often change the composition without notice.

NEUROPSYCHIATRIC DIAGNOSIS

To the Editor:—Two years ago a woman, aged 28, developed a severe diarrhea. The stool contained blood and mucus. Repeated stool examinations were made for Amoeba histolytica but was not found. In several weeks she developed an acute condition of the abdomen and was hospitalized and seen by five consultants, who all recommended an exploratory laparotomy. This was done and nothing was found except a slight peritoneal injection extending for about 8 inches from the ileocecal valve. The appendix was removed and found to have some round cell infiltration. She had an uneventful convalescence and the diarrhea stopped for about three weeks, after which it recurred and she noticed moderate irregular pains in the abdomen and also complained of severe pains in the chest. Stool examinations were again done and finally Amoeba histolytica was found. Since that time she has had every known treatment for amebic dysentery and the colitis has cleared up, but she has gradually developed a generalized hyperesthesia of the skin, which is more pronounced on the left side. This has become so severe that the light pressure of a stethoscope causes an intense pain. The only time she is free from pain is when standing on her feet unclothed. The pressure of her body against the bed causes pain that makes it impossible for her to sleep. She has been roentgenographed many times and her basal metabolic rate is plus 13. She has a daily fever up to 100 F. and her pulse is consistently around 120. She has been examined thoroughly by a proctologist, two internists and a leading neurologist. One internist believes that her symptoms are due to the dysentery and the other believes that she has an arthritis of the spine, in spite of the negative roentgenograms. The neurologist is of the opinion that there is a visceral nerve imbalance and states that not only has he never seen a similar case but he has never heard of one and offers no suggestions as to a possible cure. The neurologic examination was entirely negative. She has had all the usual sedatives and hypnotics, but even the morphine will not relieve the pain. She has had streptococcus vaccines and tissue extract. Have you any suggestions to offer that could possibly relieve this pain? Please omit name.

M.D., Washington.

ANSWER.—The absence of any positive neurologic signs and the bilateral nature of the symptom, even though it is worse on the left side, does not fit in with any known neurologic disturbance of an organic nature. The possibility of a thalamic syndrome as described by Head and Holmes must be borne in mind, but the query definitely states that the neurologic examination was entirely negative. If this is true, one must consider the patient to have a functional or psychogenic hyperesthesia. A psychiatric study of the patient should be made and it is suggested that one of the possible methods of attack be hypnotism.

TOLUENE POISONING

To the Editor:—What are the symptoms, prognosis and treatment of toluene poisoning? Is it possible for a man working with toluene for two years to develop an acute poisoning, or is it always due to an accumulation?

JACOB LEVITT, M.D., Detroit.

ANSWER.—Toluene (toluol) poisoning may arise either as an acute or as a chronic disease, and the two may coexist. The symptoms of toluene poisoning are very similar to those from benzene. Given equal exposure, narcosis from toluene is perhaps more likely to arise than from benzene. Acute toluene poisoning has as its chief manifestations those commonly associated with an asphyxiating substance. Dr. Alice Hamilton's description of acute benzene poisoning (Benzene [Benzol] Poisoning, *Arch. Path.* **11**:434 [March], 601 [April] 1931) extensively applies to its homologue toluene so far as manifestations are concerned. From McCord and others in their brochure "Benzol (Benzene) Poisoning" the following excerpts are derived, which though descriptive of the acute action of benzene indicate the type of acute action of toluene:

High concentrations of benzene may lead to immediate, pronounced effect upon the central nervous system, culminating in violent convulsions and narcosis.

After death from acute benzene asphyxiation there may be no demonstrable anatomical changes, or there may be evidence of hemorrhage, engorged blood vessels, noncoagulability of the blood, particularly if the victim lives several hours after exposure.

At autopsy an odor of benzene may be detected, but not invariably so. Before death an odor of benzene on the breath is not unusual.

Irregularly, benzene may be recovered from tissues through distillation methods. Based upon experimental work, methods have been described for the detection of benzene and phenol during acute poisoning.

Phenol, or substances chemically similar to phenol, have been found in the urine, but there have been instances of failure to find such bodies.

Toluene and xylene probably are capable of producing acute poisoning more readily than benzene. No difference in manifestations is known to exist.

The prognosis for either acute or chronic toluene poisoning in severe form is not good. If the patient survives severe acute poisoning for one week, the prognosis may be better than in the case of severe chronic poisoning, because of the damage in the latter instance that is brought about to the hematopoietic tissues. In chronic poisoning a prime hazard to a good prognosis resides in the marked susceptibility to infections. Most fatalities are produced as a result of infection. At times hem-

orrhages into the various organs, such as the heart or brain, may lead to permanent abnormality, even though the blood picture may return to normal and even though the marked susceptibility to infectious processes may have disappeared. A good prognosis for either acute or chronic toluene poisoning is not warranted until late in the course of the disorder, when it appears that substantial gains have been made. The treatment of toluene poisoning is the same as for benzene poisoning and is far from satisfactory. Davis sums up the trend of treatment thus:

> Elimination; aeration; treatment of gastric disturbances; treatment of anemia; supportive measures for the heart and kidneys; stimulation of the blood-forming organs, by iron compounds, x-ray of long bones, liver and spleen substances, and transfusions; nourishing foods, with excess of fats; increased calcium intake.

McCord *(ibid.)* furnishes additional procedures as follows:

> The person suffering from any form or degree of severity of benzene poisoning should not be permitted to continue exposure to that substance. Hospital care is indicated for all systemic poisonings from benzene, but it is not necessary for the more frequently encountered dermatitis. Acute poisoning (asphyxiation) may require artificial respiration supplemented by the Henderson and Haggard inhalator, if available. Muscular exertion should be avoided. The rescuer of an unconscious man in enclosed areas, such as a tank car, apparently is more likely to die than the unconscious man who quietly entered that state. Cardiac and respiratory stimulants may be required. Lecithin emulsion (5 cc. of a 10 per cent strength) has been administered intravenously to advantage. Convalescence should be extended to avoid complications. Chief among these are pneumonia, bronchitis, gastritis and cystitis. Acute benzene poisoning may be produced by the oral intake of benzene in error or for suicidal purposes. Emptying of the stomach is indicated. Profound local irritation is prone to take place. The administration of alkaline fluids such as milk is commendable. In the chronic case, hemorrhage and proneness to infection largely determine the treatment. Blood coagulants are rarely of value. Prompt transfusions are desirable whenever hemorrhage is present, even though the general situation is not grave. Under no circumstances should the severely poisoned victim of benzene be subjected to such procedures as dental extractions, tonsillectomies, etc. The judicious use of liver preparations is indicated. Those practices that attend the proper use of liver in other severe anemias should govern its administration. Sunlight, natural or artificial, has proven valuable.

BRUCELLA ABORTUS INFECTION

To the Editor:—My inquiry concerns Brucella abortus infection. A mother of two healthy children, with all past history negative, becomes pregnant about the time that a herd of cows from which she received her milk supply is diagnosed as being infected with Brucella abortus. She is delivered of a stillbirth of eight months. The mother's antepartum history is negative. What is the method of procedure in determining whether the mother is infected? Is there any particular time that an abortion, miscarriage or stillbirth may occur?

LOUIS H. SWETERLITSCH, M.D., Coraopolis, Pa.

ANSWER.—In 1917 de Forest (*Am. J. Obst. & Dis. Women & Child.* **76**:221 [Aug.] 1917) reported eleven cases of abortion in women in which there was strong circumstantial evidence that the occurrence of abortion was related to contagious abortion of cattle. In several instances the women aborted during the time of an epidemic of contagious abortion among the cattle on their farms. There is evidence that Brucella organisms occasionally exhibit a predilection for the genital tract of human beings as in cows or bulls. Kristensen (*Ann. de méd.* **26**:339 [Nov.] 1929) isolated the abortus variety of the organism from the exudate which covered the uterine site of the placenta of a seven months fetus. Carpenter and Boak (THE JOURNAL, April 11, 1931, p. 1212) recovered Brucella from the tissues of a human fetus which was aborted at the end of the fourth month of gestation. Frei (*Schweiz. med. Wchnschr.* **59**:334 [March 23] 1929) isolated Brucella from the vaginal discharge of a woman who had aborted ten days previously. Simpson, Harbinson and Ey have found strongly circumstantial clinical and serologic evidence that Brucella infection was a factor in the production of several cases of human abortion. Cornell and DeYoung (*Am. J. Obst. & Gynec.* **18**:840 [Dec.] 1929) tested the blood serums of 1,015 pregnant women in Chicago. Of this number none gave definitely positive reactions and in only five instances were there weakly positive reactions. Their conclusion was that brucellosis is not generally prevalent in pregnant women in Chicago. In this connection it should be noted that most of the milk supply of Chicago is pasteurized. Adequate pasteurization destroys Brucella organisms. It seems quite probable that brucellosis is an occasional cause of human abortion, particularly among women who live on farms where they have direct contact with infected animals, as well as among women who consume unpasteurized milk and other dairy products. The agglutination test is perhaps the simplest method of determining the presence of the disease. In about 5 per cent of individuals with brucellosis, antiabortus serum agglutinins failed to develop. If the agglutination test is negative, or positive in low titer, a diagnostic skin test may be done (Diagnosis of Undulant Fever, Queries and Minor Notes, THE JOURNAL, May 12, 1934, p. 1633). If the agglutination test and skin test are negative, it is quite probable that the patient does not have brucellosis. There is no evidence to indicate that abortion, miscarriage or stillbirth may occur from this cause at any particular period during gestation.

CONJUGAL SYPHILIS

To the Editor:—A man, aged 33, and his wife, aged 32, came to me to be treated for syphilis. He gives a history of a penile lesion when 19 years of age, which rapidly healed and the incident was forgotten until six years ago, when he developed another penile lesion, which he attributed to a scratch from a broken B. V. D. button. He consulted a physician, who suggested a Wassermann test although there were no secondary symptoms. The doctor did say he believed it was a chancre. He did not begin treatment and it spontaneously healed. Both the man's and his wife's blood at this time are 4 plus and have been for the past two years. Two years ago, because of nervousness, he again consulted the same doctor. Both he and his wife were treated. He was told that he had Malta fever as well as syphilis. He had several courses of neoarsphenamine and a bismuth compound and yellow mercurous iodide by mouth. His blood is still 4 plus. The wife is in good health. They have a son 11 years old who has a negative Wassermann reaction and no syphilis. Five years ago the wife was about six months pregnant and began to flow. She was ordered to bed for a month. She had labor pains and was taken to a hospital, and her doctor (an osteopathic physician-surgeon) did a cesarean section. The child was apparently normal but died a short time after birth and because of her exhaustion she was given several syringefuls of whole blood fresh from her husband. It was injected into her left breast. Two years ago, at the same time as her husband, she had a Wassermann test and both were 4 plus, as they are at this time. She had three neoarsphenamine injections and had a very severe arsenical dermatitis develop. A single injection of sulfarsphenamine given a month later caused another similar reaction. Neither has ever developed secondary symptoms and the doctor told them he did not believe they ever would have negative Wassermann reactions but advised that they take a course of treatment once a year. I would appreciate your giving me an outline of treatment, a prognosis and anything else that you believe would be helpful. Please omit my name.

M.D., California.

ANSWER.—The history of a penile lesion or the history that no penile lesion was ever noted by a patient should have no weight in the decision as to whether or not a patient should be treated for syphilis. The fact that this couple have had repeatedly positive Wassermann reactions is highly suggestive that they both have syphilis. As several pertinent facts are not given in the query it is quite impossible to offer a prognosis or adequately outline treatments for these patients. It would be advisable to examine the spinal fluids of both patients and to examine them both for evidence of cardiovascular, visceral or other evidence of syphilis, and also to record if possible the exact amount of treatment of all types that the patients have received. The details and type of the subsequent treatment will depend on the result of these examinations, but even though the cerebrospinal fluid and clinical examination are both negative the patients have not had a sufficient amount of treatment and both are sufficiently young to warrant intensive treatment with the arsphenamines and preparations of bismuth. If, on the other hand, the spinal fluids were positive or visceral evidence of syphilis is elicited, the treatment should be given according to the type of complication noted.

SALT RETENTION IN PEMPHIGUS

To the Editor:—Would it be out of order for me to ask you to ask the writer of the query on pemphigus in THE JOURNAL, Oct. 19, 1935, about his statement that salt retention is a feature of pemphigus? I should like to know the source of his information for that statement. I have never noticed any such retention in the study of my patients, but if it does occur, I think it is a very important point.

M. F. ENGMAN, M.D., St. Louis.

ANSWER.—There is plenty of authority for the statement that salt retention occurs in pemphigus. Riecke, (in the Handbuch der Haut- und Geschlechtskrankheiten, 7/2, Berlin, Julius Springer, 1931) devotes eight pages (511-518 inclusive) to a review of the literature of this subject. The phenomenon was first noted by K. Krieger in 1872. He found hardly any sodium chloride in the urine of a woman, aged 23, with pemphigus foliaceus. Fodor in 1895, in a case of pemphigus in which the whole body was involved, found hardly a fifth of the normal amount of sodium chloride in the urine. Since then there have been many reports, most of them agreeing that, during severe attacks of pemphigus, salt excretion in the urine, feces and sweat is at a minimum. Cassaët and Michelson in 1906 stated their opinion that salt retention means a general alimentary

intoxication and that a salt-free diet causes improvement of the pemphigus with increased elimination of salt in the urine. They also thought that there was with this increase a greater elimination of the toxins. Vanrobert in 1930 obtained the same results; with much salt in the diet there was retention. With a salt-free diet there was a gradual return to balance between intake and elimination. Moreinis and Medvedev in 1927 at postmortem examination in a case of pemphigus found salt retention in all organs except the spinal cord and the skin. Sabrazès and Torlais in 1929 warned against the use of a salt-poor diet, especially in cachectic cases, because it has not been proved that salt retention is due to kidney dysfunction.

Salt retention is not due to storing of salt in the fluid of bullae, for several authors have reported marked retention of salt in cases in which only mouth involvement before the skin involvement had occurred. In 1926 Urbach found low salt elimination with a normal amount in the blood, and in four cases without increased salt in the diet there was an increase in the sodium chloride content of the skin. He thinks that salt retention is a protective function with increase of albumin destruction. Skin involvement, disturbance of sodium chloride metabolism and albumin destruction are coordinate symptoms of pemphigus.

Leszczynski and Blatt in 1927 showed that sodium chloride retention fluctuated with eosinophilia, temperature and variation in severity of the eruption; and that thirst, as manifested by shortened time of resorption of a wheal made with 4 per cent sodium chloride, also ran parallel with these.

Riecke's summary accords salt retention no place in the etiology or pathogenesis of pemphigus. It may be a protective phenomenon, retention of sodium chloride sparing albumin. This may be only apparent, however. Salt is retained during the florid period, increase of salt in the diet lessens excretion of salt in the urine, and lessening salt in the diet improves salt elimination. It is not peculiarly specific for pemphigus but occurs in other diseases in which tissue is destroyed. Riecke suggests that further studies should be made of the effect of increase of dietary salt during latent periods and of endocrine anomalies in cases of pemphigus.

ADMINISTRATION OF DIGITALIS

To the Editor:—In a recent publication a well known cardiologist discusses a case in which a diagnosis was made of chronic rheumatic heart disease (inactive), with mitral stenosis and insufficiency, cardiac hypertrophy with auricular fibrillation and congestive failure, dependent edema, ascites, and right hydrothorax. After the congestive failure has been cleared up by bed rest, digitalis and salyrgan, the patient was discharged from the hospital. A rigid cardiac regimen was instituted, and the patient was advised to take tincture of digitalis intermittently, 1.5 cc. of standardized tincture (1.5 cat units) three times daily for two consecutive days each week. The patient's weight was 120 pounds (54 Kg.). If the patient had left the hospital fully digitalized, she would have excreted most of her digitalis within the next five days, before the 9 cat units of tincture was administered over a two day period. Although this dose is more than is usually necessary to maintain digitalization, I do not believe it can have any effect on a patient already digitalized. I would appreciate an opinion on the following: Would this method of administering digitalis have any appreciable effect in preventing a recurrence of congestive failure? Would it have any effect in reducing a pulse deficit? Would these effects be maintained during the five days digitalis was not taken? Digitalis is often given in single doses of from 1 to 5 cat units, subcutaneously or intravenously, when it is believed that the heart is failing, as during the course of an acute infectious disease or after an extensive surgical procedure. Do such single doses exert any appreciable effect on the heart or circulation of patients not already fully digitalized? What is the present opinion on the daily use of minimal doses of digitalis (i. e., less than 1 cat unit daily) as a heart tonic or to prevent the onset of congestive failure? Please omit name. M.D., New York.

ANSWER.—The advice given in this case was doubtless based on the rate of digitalis excretion as observed during the patient's stay in the hospital and was also probably given tentatively, to be changed from time to time as conditions indicated.

The rate at which digitalis bodies are detached from the heart muscle and excreted varies so much with each individual that no rules as to a maintenance dose can be formulated. It is moderately constant for the individual, but not so constant that it does not have to be watched from time to time. The patient can successfully be taught to maintain an adequate dosage. The physician should be guided by the clinical results and not by the pulse deficit. Cases occur in which the minute value is greater and the heart more efficient with a greater pulse deficit, or in whom evidences of passive congestion occur when the rate is slowed and there is no pulse deficit.

The dosage given in this case was quite enough to maintain the desired effect. Some cases might need more, some might need less. It might be better to give daily small doses sufficient to maintain the digitalis level, but it is not important.

It is probable that the single doses given as stated have no effect in cases in which digitalis has not previously been given. They at least do no harm, as larger doses might do unless definitely indicated.

The use of minimal daily doses of digitalis as suggested is a matter of opinion, and evidence as to the advantage or disadvantage is not clearly substantiated.

ONE DOSE ANTIRABIES VIRUS—DISTEMPER SERUM

To the Editor:—Please give your opinion as to the value of the one dose antirabies virus which is given to dogs as a preventive of rabies. I am interested in this from a public health standpoint. What is the value of distemper serum? M.D., Georgia.

ANSWER.—According to available information, the preventive inoculation of dogs with one dose of phenolized vaccine against rabies is still in the experimental stage. The method is not established as uniformly successful and reliable in practice, though its use is recommended by many veterinarians.

So far as is known, no serum has been developed against distemper, but the vaccine of attenuated living virus of Laidlaw and Dunkin appears to be effective in preventing the disease.

USE OF TETANUS ANTITOXIN

To the Editor:—In the discussion on vaccination by Dr. J. P. Leake in THE JOURNAL, Oct. 27, 1934, page 1275, the final thought seems to indicate that the use of tetanus antitoxin, in Dr. Leake's opinion, should be universal in the case of any wounds. I know that it is contended by some authorities that all persons injured in automobile accidents should receive immunizing doses of tetanus antitoxin. I know that many men hardly dare fail to give an immunizing dose in any puncture of the foot particularly, but in a workmen's compensation case seen a few years ago the patient had a serum reaction, and the medical adviser of the board stated that it was not current practice to use immunizing doses except in puncture wounds in the environment of stables and similar places. He said that it was permissible to use them but rather better judgment to refrain from using them. One is impressed by the rarity of tetanus when considering the frequency of wounds of all types, and even of puncture wounds that occur in civil life. I should be glad to see an authoritative discussion of this subject. I have a feeling that perhaps commercial interests are to some degree responsible for a lot of antitetanic serum used. ELMER S. BAGNALL, M.D., Groveland, Mass.

ANSWER.—The tetanus bacillus and its spores are so widely distributed in nature that any accidental wound may become infected. It is true that in civil life only a small percentage of such wounds are followed by tetanus, but unfortunately there is no way of telling beforehand whether tetanus will develop from a given wound. Tetanus is a deadly disease. While tetanus antitoxin will prevent tetanus, it has little curative effect on the established disease. In view of these facts the physician on whom falls the duty to treat first a wounded person cannot expect to escape blame should tetanus develop in a case in which he ventured "to take a chance" and not inject antitoxic serum.

CHANGES IN NEW U. S. PHARMACOPEIA

To the Editor:—I have been informed that there have been certain changes made in the new U. S. Pharmacopeia since its issuance. If so, will you kindly state whether or not these will affect the prescribing physician seriously. L., Wisconsin.

ANSWER.—There have been a number of corrections in the U. S. Pharmacopeia XI. In compiling a book of such magnitude, typographical errors are bound to creep in. Many of these have been corrected and are of a nature which does not affect the prescribing physician directly. The essential changes with which the physician should be conversant are as follows:

1. The new Pharmacopeia directs that distilled water shall be used in all formulas. This requirement has been revised to permit the use of natural water of good quality as an alternative to distilled water in the extraction of U. S. P. vegetable drugs and in the manufacture of Resin of Podophyllum and of Saponated Solution of Cresol.

2. Dextrose: After the section Tests for Purity (p. 135) the following note has been added: "In preparing aqueous solutions of Dextrose it is permissible to use a dextrose which does not conform to the official requirements for water of hydration, provided the product meets all other official tests for purity and also provided suitable allowance is made for the difference in water content."

3. Diluted Erythrityl Tetranitrate: The dosage (p. 150) has been changed from 0.3 Gm. (5 grains) to 0.03 Gm. (½ grain). [Typographical error.]

4. Solution of Irradiated Ergosterol: The synonym "Viosterol in Oil" has been added (p. 208).

Medical Examinations and Licensure

COMING EXAMINATIONS

STATE AND TERRITORIAL BOARDS

ALABAMA: Montgomery, June 29-July 1. Sec., Dr. J. N. Baker, 519 Dexter Ave., Montgomery.

ALASKA: Juneau, Sept. 1. Sec., Dr. W. W. Council, Juneau.

ARIZONA: Phoenix, Oct. 6-7. Sec., Dr. J. H. Patterson, 826 Security Bldg., Phoenix.

ARKANSAS: *Basic Science.* Little Rock, Nov. 2. Sec., Mr. Louis E. Gebauer, 701 Main St., Little Rock. *Medical (Regular).* Little Rock, Nov. 10. Sec., Dr. A. S. Buchanan, Prescott. *Medical (Eclectic).* Little Rock, Nov. 10. Sec., Dr. Clarence H. Young, 207½ Main St., Little Rock.

CALIFORNIA: Sacramento, Oct. 19-22. Sec., Dr. Charles B. Pinkham, 420 State Office Bldg., Sacramento.

COLORADO: Denver, Oct. 6. Sec., Dr. Harvey W. Snyder, 422 State Office Bldg., Denver.

CONNECTICUT: *Basic Science.* New Haven, Oct. 10. *Prerequisite to license examination.* Address, State Board of Healing Arts, 1895 Yale Station, New Haven.

DISTRICT OF COLUMBIA: Washington, Jan. 11-12. Sec., Commission on Licensure, Dr. George C. Ruhland, 203 District Bldg., Washington.

FLORIDA: Jacksonville, Nov. 16-17. Sec., Dr. William M. Rowlett, P. O. Box 786, Tampa.

GEORGIA: Atlanta, Oct. 13. Joint-Sec., State Examining Boards, Mr. R. C. Coleman, 111 State Capitol, Atlanta.

IDAHO: Boise, Oct. 6. Commissioner of Law Enforcement, Hon. Emmitt Pfost, 205 State House, Boise.

ILLINOIS: Chicago, Oct. 20-22. Superintendent of Registration, Department of Registration and Education, Mr. Homer J. Byrd, Springfield.

IOWA: *Basic Science.* Des Moines, Oct. 13. Sec., Prof. Edward A. Benbrook, Iowa State College, Ames.

KENTUCKY: Louisville, Dec. 2-4. Sec., State Board of Health, Dr. A. T. McCormack, 532 W. Main St., Louisville.

LOUISIANA: New Orleans, December. Sec., Dr. Roy B. Harrison, 1507 Hibernia Bank Bldg., New Orleans.

MAINE: Portland, Nov. 3-4. Sec., Board of Registration of Medicine, Dr. Adam P. Leighton, 192 State St., Portland.

MARYLAND: *Regular.* Baltimore, Dec. 8. Sec., Dr. John T. O'Mara, 1215 Cathedral St., Baltimore. *Homeopathic.* Baltimore, Dec. 8-9. Sec., Dr. John A. Evans, 612 W. 40th St., Baltimore.

MASSACHUSETTS: Boston, Nov. 17-19. Sec., Board of Registration in Medicine, Dr. Stephen Rushmore, 413-F State House, Boston.

MICHIGAN: Lansing, Oct. 14-16. Sec., Board of Registration in Medicine, Dr. J. Earl McIntyre, 202-3-4 Hollister Bldg., Lansing.

MINNESOTA: *Basic Science.* Minneapolis, Oct. 6-7. Sec., Dr. J. Charnley McKinley, 126 Millard Hall, University of Minnesota, Minneapolis. *Medical.* Minneapolis, Oct. 20-22. Sec., Dr. Julian F. DuBois, 350 St. Peter St., St. Paul.

MONTANA: Helena, Oct. 6. Sec., Dr. S. A. Cooney, 7 W. 6th Ave., Helena.

NEBRASKA: *Basic Science.* Lincoln, Oct. 6-7. Dir., Bureau of Examining Boards, Mrs. Clark Perkins, State House, Lincoln.

NEW HAMPSHIRE: Concord, Sept. 10-11. Sec., Board of Registration in Medicine, Dr. Charles Duncan, State House, Concord.

NEW JERSEY: Trenton, Oct. 20-21. Sec., Dr. James J. McGuire, 28 W. State St., Trenton.

NEW MEXICO: Santa Fe, Oct. 12-13. Sec., Dr. Le Grand Ward, Santa Fe.

NEW YORK: Albany, Buffalo, New York and Syracuse, Sept. 21-24. Chief, Professional Examinations Bureau, Mr. Herbert J. Hamilton, 315 Education Bldg., Albany.

NORTH CAROLINA: Raleigh, Nov. 30. Sec., Dr. Ben J. Lawrence, 503 Professional Bldg., Raleigh.

NORTH DAKOTA: Grand Forks, Jan. 5-8. Sec., Dr. G. M. Williamson, 4½ S. 3rd St., Grand Forks.

OKLAHOMA: Oklahoma City, Dec. 9. Sec., Dr. James D. Osborn, Jr., Frederick.

OREGON: *Basic Science.* Portland, Nov. 21. Sec., Mr. Charles D. Byrne, University of Oregon, Eugene. *Medical.* Portland, Jan. 5-7. Sec., Dr. Joseph F. Wood, 509 Selling Bldg., Portland.

PUERTO RICO: San Juan, Sept. 1. Sec., Dr. O. Costa Mandry, Box 536, San Juan.

RHODE ISLAND: Providence, Oct. 1-2. Chief, Division of Examiners, Mr. Robert D. Wholey, 366 State Office Bldg., Providence.

SOUTH DAKOTA: Pierre, Jan. 19-20. Dir., Division of Medical Licensure, Dr. Park B. Jenkins, Pierre.

VERMONT: Burlington, Feb. 10-12. Sec., Board of Medical Registration, Dr. W. Scott Nay, Underhill.

VIRGINIA: Richmond, Dec. 9-13. Sec., Dr. J. W. Preston, 28½ Franklin Road, Roanoke.

WISCONSIN: *Reciprocity.* Madison, Sept. 8-9. Sec., Dr. Robert E. Flynn, 401 Main St., La Crosse. *Basic Science.* Madison, Sept. 26. Sec., Prof. Robert N. Bauer, 3414 W. Wisconsin Ave., Milwaukee.

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS. *Parts I and II.* Sept. 14-16. Ex. Sec., Mr. Everett S. Elwood, 225 S. 15th St., Philadelphia.

SPECIAL BOARDS

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY: Philadelphia, June. Sec., Dr. C. Guy Lane, 416 Marlboro St., Boston.

AMERICAN BOARD OF INTERNAL MEDICINE: *Written* examination will be held simultaneously in different centers of the United States and Canada in December. *Practical* or *clinical* examination will be given in St. Louis in April. Chairman, Dr. Walter L. Bierring, 406 Sixth Ave., Des Moines.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: Written examination and review of case histories of Group B candidates will be held in various cities in the United States and Canada, Nov. 7. *Applications must be filed at least sixty days prior to the examination.* Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh (6).

AMERICAN BOARD OF OPHTHALMOLOGY: New York, Sept. 26. Sec., Dr. John Green, 3720 Washington Blvd., St. Louis.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY: Cleveland, Jan. 9. Sec., Dr. Fremont A. Chandler, 180 N. Michigan Ave., Chicago.

AMERICAN BOARD OF OTOLARYNGOLOGY: New York, Sept. 25-26. Sec., Dr. W. P. Wherry, 1500 Medical Arts Bldg., Omaha.

AMERICAN BOARD OF PEDIATRICS: San Francisco, Oct. 22-24. Baltimore and Cincinnati in November. Sec., Dr. C. A. Aldrich, 723 Elm St., Winnetka, Ill.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY: New York, Dec. 29-30. Sec., Dr. Walter Freeman, 1028 Connecticut Ave., Washington, D. C.

AMERICAN BOARD OF RADIOLOGY: Cleveland, Sept. 25-27. Sec., Dr. Byrl R. Kirklin, Mayo Clinic, Rochester, Minn.

AMERICAN BOARD OF UROLOGY: Chicago, Dec. 4-6. Sec., Dr. Gilbert J. Thomas, 1009 Nicollet Ave., Minneapolis.

Alabama June Examination

Dr. J. N. Baker, secretary, Alabama State Board of Medical Examiners, reports the written examination held in Montgomery, June 23-25, 1936. The examination covered 10 subjects and included 100 questions. An average of 75 per cent was required to pass. Twenty-seven candidates were examined, 23 of whom passed and 4 failed. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
Emory University School of Medicine		(1936)	84.5
Rush Medical College		(1935)	88.6, (1936) 85.2,* 85.8,* 85.8,* 85.9,* 89*
Tulane University of Louisiana School of Medicine		(1935)	77.7, 82.2, (1936) 79.5, 83.1, 83.3, 84.5, 89.1
Harvard University Medical School		(1936)	87.4
Washington University School of Medicine		(1934)	87.9, (1936) 82.9
Western Reserve University School of Medicine		(1936)	88.5
University of Pennsylvania School of Medicine		(1933)	85.5, (1934) 84
University of Tennessee College of Medicine		(1935)	75.6
Vanderbilt University School of Medicine		(1934)	81.7
University of St. Andrews Conjoint Medical School, Scotland		(1935)	79.1
School	**FAILED**	**Year Grad.**	**Per Cent**
Medical College of Alabama		(1904)	63.9
Meharry Medical College		(1912)	43.8
Regia Università degli Studi di Genova. Facoltà di Medicina e Chirurgia		(1930)	69.6
Regia Università di Napoli Facoltà di Medicina e Chirurgia		(1923)	58.9†

Five physicians were licensed by reciprocity from May 9 through June 13. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Emory University School of Medicine		(1934)	Mississippi
University of Minnesota Medical School		(1933)	Minnesota
University of Tennessee College of Medicine		(1933), (1934)	Tennessee
Vanderbilt University School of Medicine		(1932)	Tennessee

* This applicant has received a four-year certificate and will receive the M.D. degree on completion of internship.

† Verification of graduation in process.

Wyoming June Reciprocity Report

Dr. G. M. Anderson, secretary, State Board of Medical Examiners, reports 4 applicants licensed by reciprocity at the meeting held in Cheyenne, June 8, 1936. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Rush Medical College		(1934)	Illinois
University of Nebraska College of Medicine		(1935)	Nebraska
Osteopaths *			Colorado, Missouri

* Licensed to practice osteopathy and surgery.

Minnesota April Report

Dr. Julian F. Du Bois, secretary, Minnesota State Board of Medical Examiners, reports the oral, written and practical examination held in Minneapolis, April 21-23, 1936. The examination covered 12 subjects and included 60 written questions. An average of 75 per cent was required to pass. Sixty-two candidates were examined, all of whom passed. Five physicians were licensed by reciprocity and 1 physician was licensed by endorsement. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
Stanford University School of Medicine		(1934)	91.4
University of Georgia School of Medicine		(1932)	85
Northwestern University Medical School		(1935)	88.4
Rush Medical College		(1934)	89, 89.3, (1935) 85.6, 86.6, 87.4, 89.3, 90.3, 91.6
School of Medicine of the Division of the Biological Sciences		(1935)	86
University of Illinois College of Medicine		(1934)	89.4

Indiana University School of Medicine	(1930)	82.2, (1934) 86.3, 87.2
State University of Iowa College of Medicine	(1933)	85.3
Harvard University Medical School	(1933) 88.6, (1934)	86.5
University of Michigan Medical School	(1927)	85
University of Minnesota Medical School	(1934)	85.1, (1935) 79.1,* 81.1,* 85,* 85.1,* 85.3,* 86.2, 87,* 88.6, 89.1,* 90.1,* 91.2,* (1936) 80.1, 80.2, 83, 83, 83.3, 84, 84.6, 84.6, 85.1, 85.4, 86, 86.1, 86.1, 86.3, 86.3, 86.4, 87.4, 89.1, 90.6, 90.6, 91.2,* 91.3
Creighton University School of Medicine	(1935)	83.2
University of Nebraska College of Medicine	(1930)	85.4
University of Cincinnati College of Medicine	(1934)	86.2
University of Pennsylvania School of Medicine	(1934)	83.2
University of Texas School of Medicine	(1933)	88.3
University of Wisconsin Medical School	(1932) 85.6, (1935)	90.1
University of Toronto Faculty of Medicine	(1928)	86.6

LICENSED BY RECIPROCITY

School	Year Grad.	Reciprocity with
Rush Medical College	(1928), (1930)	Illinois
University of Illinois College of Medicine	(1934)	Illinois
University of Michigan Medical School	(1930)	Wisconsin
Woman's Medical College of Pennsylvania	(1929)	Penna.

LICENSED BY ENDORSEMENT

School	Year Grad.	Endorsement of
Harvard University Medical School	(1930)	N. B. M. Ex.

* This applicant has received the M.B. degree and will receive the M.D. degree on completion of internship.

Book Notices

Epitome of the Pharmacopeia of the United States and the National Formulary, with Comments. Prepared for the Use of Physicians under Authorization of the Council on Pharmacy and Chemistry of the American Medical Association by a Committee of Council Members: Robert A. Hatcher, Ph.M., M.D., Professor of Pharmacology, Emeritus, Cornell University Medical College, Chairman of the Committee; Ernest E. Irons, Ph.D., M.D., Clinical Professor of Medicine, Rush Medical College; Torald Sollmann, M.D., Professor of Pharmacology and Materia Medica, School of Medicine, Western Reserve University, and Paul Nicholas Leech, Ph.D., Secretary of the Council on Pharmacy and Chemistry. Fifth edition. Cloth. Price, 60 cents. Pp. 240. Chicago: American Medical Association, 1936.

The new (fifth) edition of this book differs considerably from the preceding editions both in context and in appearance. The present volume contains only those items which are official in either the new (eleventh) Pharmacopeia of the United States or the new (sixth) National Formulary. The result is that 343 items are omitted, 202 are newly admitted and 118 appear under new names. The same care has been used in revising the sections on actions and uses of the retained items as in formulating those sections for the new admissions. This edition is the first to include the italicized statements of caution found in the Pharmacopeia and National Formulary. The make-up has been improved by more uniform spacing of sections, preparations and items. The older plain red cover has been replaced by a green cover with the title on both the cover and the back bone. The newness of the book is further apparent in that those items which are to appear in the forthcoming edition of Useful Drugs are designated by a star. This new summary of the two official drug standards as extracted and augmented under the supervision of the Council on Pharmacy and Chemistry should prove even more useful than preceding editions.

Bacteriology in Relation to Clinical Medicine, Theoretical and Applied: For Students, Laboratory Workers and Practitioners in Medicine and Public Health. By M. N. De, M.B., M.R.C.P., Professor of Pathology, Medical College of Bengal, Calcutta, and K. D. Chatterjee, M.B., Medical Registrar, Medical College Hospitals, Calcutta. Cloth. Price, 30s.; Rs. 15/. Pp. 599, with 276 illustrations. Calcutta: The "Statesman" Press, 1935.

This volume, essentially a textbook of bacteriology, presents data concerning micro-organisms commonly associated with disease in man. The several chapters describe the individual organisms, their identifying biologic characteristics and their relation to disease, and, in addition, consider the pathology of the disorders induced by the pathogenic agents. The minutiae of the technical procedures of a bacteriologic laboratory, such as the preparation of culture mediums, bacterial stains, serologic tests and animal inoculations commonly used for diagnostic purposes, are described in detail. In this respect it is the equivalent of a laboratory manual. Comments on pathogenesis and descriptions of pathologic processes are presented in condensed form but are not elaborated to the extent of the bacteriology. The combining of bacteriology and the related pathology is the special feature that is stressed by the authors. Bearing in mind that the book was designed for "students, laboratory workers and practitioners in medicine and public health," one finds the subject matter treated in an orthodox and elementary way favorable to the initiation of beginners in the subject. The information is presented in simple and clear phraseology and includes, with a few exceptions, the reports in current literature. As might be expected from the residence (Calcutta) of the authors, their consideration of the infectious agents and processes prevalent in India reflects an intimate experience, which makes the chapters devoted to these subjects the best of the book. The laboratory methods, described in detail, consist of many in universal use and others that are less regularly adopted in this country. There are numerous illustrations, many of which are colored. The selection and presentation of illustrations are excellent and form an unusually pleasant, as well as informative, feature of the book. The paper, type and format are to be commended for promoting the general attractiveness of the volume. Special students and investigators will find that, in some of the subjects, simplicity and brevity have been maintained at the expense of important, though perhaps not elementary, points of view, and that the disposition of other material with paragraphic generalizations leaves much that is significant untouched. There is no bibliography.

Physical Therapy for Nurses. By Richard Kovács, M.D., Clinical Professor and Director of Physical Therapy, Polyclinic Medical School and Hospital, New York. Cloth. Price, $2.75. Pp. 286, with 78 illustrations. Philadelphia: Lea & Febiger, 1936.

Realizing that nurses are constantly called on to give physical therapy treatments, the author has prepared this book with the idea that it will serve primarily as a manual for nurses. The book is divided into nine chapters, comprising a general survey of physical measures, simple physics, heat, sunlight, electricity, water, massage, exercise, and institutional practice. The chapter on general physics deals primarily with physical energy as applied directly to physical therapy. The language used should be readily understandable to those who have had a course in high school physics. The chapter on sunlight deals with the radiation not only from the sun but also from artificial sources. The dangers are pointed out that may befall the uninformed when using physical therapy equipment. Of particular value to nurses is the information on heat, massage, hydrotherapy and exercise. It is highly probable that a nurse may use these practical forms of treatment more than any other physical therapy agent. The technic of hydrotherapy procedures such as baths, packs and compresses, which are regular nursing procedures, is given in detail. The technic of massage and its descriptive movements are effectively recounted. The chapter on exercise, prepared by Dr. Madge C. L. McGuinness, deals with muscle training, athletics, formal gymnastics, and the physiologic effects of exercise. The final chapter, on physical therapy in institutional practice, contains information on personnel, relation of the physical therapy department to other departments, location, space, equipment and records. The author suggests the amount of equipment required for a physical therapy department in a clinic handling from thirty to fifty cases daily—a courageous undertaking. He points out that the appliances should be accepted by the Council on Physical Therapy of the American Medical Association. He proposes that the apparatus need not be complicated and suggests that the simpler equipment be used whenever possible. The clear, compact information contained in this volume should be of great help to graduate nurses who have not had instruction in this type of treatment. It should be of particular value also to teachers of physical therapy in nurses' training schools.

La syphilis gastrique: Etude clinique. Par Anastase Landau, médecin des hôpitaux de Varsovie et Joseph Held, médecin du 1er Service de l'Hôpital "Wolski," à Varsovie. Paper. Price, 32 francs. Pp. 185, with 15 illustrations. Paris: Masson & Cie, 1936.

The authors describe what is called "syphilitic gastritis" in fifty-eight of a hundred cases of late syphilis. Their criteria for this diagnosis are hypo-acidity or anacidity together with a delay or absence of the secretion of neutral red in the stomach contents, the dye being injected subcutaneously. Similar studies in a control group of normal patients are lacking. True organic disease of the stomach due to syphilis is next considered. Three types of lesions are said to exist: ulceration of the stomach, single or multiple; pseudoneoplastic, and linitis plastica. The improvement obtained with antisyphilitic treat-

ment forms practically the sole basis for their diagnosis of stomach syphilis. A section is devoted to gastric complaints in neurosyphilis, especially the gastric crises of tabes, and what is termed "syphilitic gastric radiculitis." This book offers interesting reading, and though it presents little that is new it is of value in directing the attention of the internist to the possible manifestations of gastric syphilis.

A Systematic Handbook of Volumetric Analysis or the Quantitative Determination of Chemical Substances by Measure, Applied to Liquids, Solids, and Gases, Adapted to the Requirements of Pure Chemical Research, Pathological Chemistry, Pharmacy, Metallurgy, Manufacturing Chemistry, Photography, etc., and for the Valuation of Substances Used in Commerce, Agriculture, and the Arts. By Francis Sutton, F.I.C., F.C.S. Twelfth edition, revised with numerous additions, by A. D. Mitchell, D.Sc., F.I.C., Scientific Assistant, University of London. Cloth. Price, $10. Pp. 631, with 128 illustrations. Philadelphia: P. Blakiston's Son & Co., Inc., 1935.

This volume enjoys an enviable reputation as a standard work in the field of volumetric analysis. After the three score and ten years since the first edition was published, the volume is now found in its twelfth edition. Its age is proof of its merit and the service it has rendered, but during this span of years volumetric analysis has grown to be a large, unwieldy mass of information. It is therefore undoubtedly true that this volume does not cover the field of volumetric analysis now as thoroughly as did the first volume seventy years ago. In this connection the authors suggest in the preface to this edition:

> It is regretted that space does not permit of the inclusion of a section on Microchemical Titration, but the advances in this region have been so great as to render this impracticable.

For general methods it is as valuable as ever. Discussion of these methods and references to the original papers are particularly valuable. In many cases specialized methods will have to be sought elsewhere.

Medizinische Praxis: Sammlung für ärztliche Fortbildung. Herausgegeben von Prof. Dr. L. R. Grote, Leitender Arzt der Medizinischen Klinik des Rudolf-Hess-Krankenhauses Dresden, Prof. Dr. A. Fromme, Direktor der chirurgischen Abteilung des Stadtkrankenhauses Dresden-Friedrichstadt, und Prof. Dr. K. Warnekros, Direktor der staatlichen Frauenklinik zu Dresden. Band IX: Blutung und Fluor. Von Prof. Dr. Hans Runge, Direktor der Universitäts-Frauenklinik Heidelberg. Second edition. Paper. Price, 7 marks. Pp. 117, with 18 illustrations. Dresden & Leipzig: Theodor Steinkopff, 1936.

This small book is one of a series of monographs written expressly for general practitioners on a variety of medical topics. It is full of valuable information on the subjects of uterine bleeding and vaginal discharges. In the discussion of uterine bleeding the author includes the most recent advances made in the field of endocrinology as they pertain to his subject. The section dealing with the treatment of menstrual disturbances is especially useful because of the author's sane attitude on the use of endocrines. The chapter on leukorrhea likewise contains sound advice concerning therapy. The booklet should prove useful to any physician who desires a comprehensive knowledge of uterine bleeding and vaginal discharges.

La rate en pathologie sanguine. Par Emile Houcke, médecin des Hôpitaux de Lille. Préface de M. le Professeur Curtis. Paper. Price, 45 francs. Pp. 157, with 20 illustrations. Paris: Masson & Cie, 1936.

This monograph concerns itself with the histopathologic, clinical and therapeutic aspect of enlarged spleens. The work is based on original studies previously published by the author and for the most part represents his personal observations. The text is divided into four parts. The first part is devoted to the hematopoietic reactions of the spleen from both experimental and anatomopathologic points of view. The following division is concerned with splenomegaly accompanying the reactions of the reticulo-endothelial system. The third is a consideration of the spleen in its relation to hemolytic anemias. The last chapter treats the circulatory disturbances in which the spleen may become involved. In this chapter the author presents an excellent discussion of Banti's syndrome. The neoplastic splenomegalies were not considered, as this phase of the subject was not included in the author's research program. The contribution is mainly from the anatomopathologic aspect of splenic reaction. With the aid of his histologic data the author has attempted to group the splenomegalies according to their morphologic alterations. Three general groupings have been adopted: hematopoietic, reticulo-endothelial and sclerotic. In some respects the first two groupings overlap. In adopting such a general classification the author hopes to reduce the multiplication of types often found in a clinical grouping. The material is well presented and organized. The illustrations are in black and white. While the monograph does not solve many of the problems of splenomegaly, still poorly understood, it is a provocative and informative piece of work. The work should interest the clinician as well as the pathologist, for many of his therapeutic considerations are based on the clinical application of such data.

Formulary of the University Hospitals of Cleveland: The Babies and Children's Hospital, the Leonard C. Hanna House, the Lakeside Hospital, the Maternity Hospital, the Rainbow Hospital. Revised by the Pharmacy Committee and Approved by the Medical Council. Paper. Pp. 81. Cleveland, Ohio: The University Hospitals of Cleveland, 1935.

The preparations in this loose-leaf formulary are selected from the Pharmacopeia, the National Formulary and New and Nonofficial Remedies. The inclusion of unofficial preparations is dependent on selection by the hospital pharmacy committee and subject to the approval by the medical council of the hospital. The items appear in prescription form with the amounts indicated metrically; they are therapeutically grouped. The book is superior to most hospital formularies in that the prescriptions are not individually numbered and it is of convenient size. Some of the official items included are designated U. S. P. or N. F.; others are not. Available N. N. R. preparations appear in a separate list. Previous editions have been in use for almost ten years and this revision should serve its purpose well.

Measles: Report of the Medical Officer of Health and School Medical Officer on the Measles Epidemic, 1933-34. London County Council, No. 3180. Paper. Price, 1s. Pp. 42. London: P. S. King & Son, Limited, 1936.

This is the fourth report on measles in London, which there assumes epidemic form regularly every two years. The first part deals with the epidemic of 1933-1934, involving 12,896 cases with 712 deaths. Valuable statistical data are given in tables in the text and the appendix. Part 2 contains special papers. E. H. R. Harries writes on points of administrative procedure, Hilda Linford reports observations on otitis media in measles, J. E. McCartney discusses the preparation of adult and convalescent serum, and William Gunn and W. T. Russell report on the use of immune measles serum in the control of outbreaks of measles in hospitals, institutions and residential schools. The data (ten tables) concern 1,874 persons inoculated with convalescent serum or with adult serum presumed to contain measles immune substances. To secure complete protection, a minimum dose of 5 cc. of convalescent serum or 10 cc. of adult serum was given to children under 3 years of age, within six days after exposure. For attenuation these amounts were given on or after the sixth day, or one-half these amounts earlier than the sixth, preferably about the third, day after exposure. Children 3 years old and over received amounts of serum graduated according to age. Of the children inoculated with adult serum for prevention, a protection rate of 78.2 per cent was secured; with convalescent serum the protection rate was 80 per cent. The serum-treated patients had milder attacks, fewer complications and a smaller death rate than the controls. The report as a whole is a valuable contribution to the study of measles as a problem in public health. Why don't the departments of health in American cities publish reports of this nature?

Organic Chemistry: A Brief Introductory Course. By James Bryant Conant, President of Harvard University. Revised, with the assistance of Max Tishler, Ph.D. Cloth. Price, $2.60. Pp. 293, with 27 illustrations. New York: Macmillan Company, 1936.

This textbook by James Bryant Conant, formerly Sheldon Emory professor of organic chemistry at Harvard University and now president of Harvard University, was written for use in a short course in organic chemistry. In the majority of cases it will be used by students who will take no more chemistry. The author attempts to arouse interest by brief descriptions of the nature and manufacture of certain well known organic compounds of commerce. There is an abbreviated discussion of biologic products such as the more common glandular principles and of the vitamins.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Dental Practice Acts: Operation of Dental Office by Layman Unlawful.—Carroll, a layman, owned and operated a dental parlor in Michigan, the dental services being rendered by three licensed dentists in his employ. He was convicted of violating section 15 of the dental practice act, which makes it unlawful for any person, not licensed to practice dentistry, to—

> operate or be a partner in the operation of, or control as proprietor, manager or otherwise, or to have any financial interest in the proceeds or receipts of or from, other than compensation as employe in the usual course of business . . . any room, office, or dental parlor where dental work is done, provided or contracted for . . .

He appealed to the Supreme Court of Michigan.

Carroll contended that the section of the dental practice act quoted violates the due process clauses of the state and federal constitutions in that it deprives him of a right to have a proprietary interest in a dental parlor, if all dental work is done by licensed dentists, and that the prohibition does not even remotely promote the public health and welfare. It is a well known fact, answered the Supreme Court, that the services rendered in the profession of dentistry are personal and call for knowledge in a high degree. To separate this knowledge from the power of control is an evil. Courts distinguish between professions and businesses. In the latter, individuals may engage in the common occupations of life, and laws which unnecessarily impair these rights must be held unconstitutional; but in the practice of a profession such as dentistry, which has to do with personal privacy and where the licentiate must possess skill and character, it is as well within the police power of a state to prohibit the ownership and operation of a dental parlor by a layman as it is to prescribe the qualifications of those who engage in the practice of dentistry.

The Supreme Court accordingly affirmed the conviction of Carroll.—*People v. Carroll (Mich.), 264 N. W. 861.*

Workmen's Compensation Acts: Rupture of Blood Vessel Attributed to Strain.—The employee, while engaged with others in lifting a heavy pipe, felt a sudden "burning sensation" from his left kneecap downward to the ankle. Total and permanent disability resulted. The district court, in a proceeding under the workmen's compensation act of Texas, awarded the employee compensation, finding that the strain had ruptured a blood vessel in the employee's leg. The insurance carrier appealed to the court of civil appeals of Texas, San Antonio.

There was evidence to show, said the appellate court, that the strain of lifting the heavy pipe resulted in the rupture of one of the blood vessels in the employee's leg and that the resulting incapacity was total and permanent. While several physicians testified that the employee's condition was due to varicose veins with which he had been afflicted for from five to twenty years, that testimony did not overcome, in the opinion of the court, the direct testimony of the employee and of his wife and son and daughter that he had never, before the accident, had any of the symptoms of varicose veins. Furthermore, two weeks before the accident, as the condition of his employment, the employer's physician gave the employee a thorough physical examination and pronounced him sound in health and fit for work. This evidence, concluded the appellate court, was sufficient to support the trial court's finding and the judgment for the employee was affirmed.—*United States Casualty Co. v. Vance (Texas), 91 S. W. (2d) 465.*

Evidence: Competence of a Chiropractor as a Witness.—In this proceeding under the workmen's compensation act of Texas, the trial court permitted, over the objection of the insurance carrier, a chiropractor to testify concerning the injuries sustained by the employee. The insurance carrier contended that the witness, being merely a chiropractor, and not a licensed physician, was disqualified from testifying concerning the condition in which he found the employee, whom he treated for four months, and to give his opinion as to the cause and effects of that condition. The witness, said the court of civil appeals of Texas, on appeal, was a graduate of a San Antonio chiropractic school and of "the well known Palmer School," and had been in active practice for more than five years. We may take judicial notice of the fact, said the appellate court, known as a matter of common knowledge, that chiropractic, "a system, or the practice, of adjusting the joints of the spine by hand for the curing of disease (Webster)," imports a study, knowledge and treatment of the human vertebrae, which includes the bones of the neck. The witness testified that he made a thorough examination of the injured man, shortly after the accident, which disclosed a "misalignment" of the "second bone of the vertebrae in the neck," and that this displaced bone pressed on the spinal cord, causing the condition in which he found the employee. The trial court, said the appellate court, did not abuse its discretion in admitting this testimony.—*Maryland Casualty Co. v. Hill (Texas), 91 S. W. (2d) 391.*

Health Insurance: Insanity as Constituting Sickness.—Insanity, said the court of appeal of Louisiana, Orleans, constitutes sickness within the meaning of an insurance policy providing certain weekly benefits in event of sickness of the insured. In the present case the insured suffered from dementia praecox, hyperphrenic type, and was committed to an institution for the insane. She was held to be sick within the meaning of the policy but recovery of benefits was disallowed because of the fact that she was not necessarily confined to bed, a condition prescribed by the policy.—*Lewis v. Liberty Industrial Life Ins. Co. (La.), 166 So. 143.*

Society Proceedings

COMING MEETINGS

American Academy of Ophthalmology and Otolaryngology, New York, Sept. 26-Oct. 3. Dr. William P. Wherry, 107 South 17th St., Omaha, Executive Secretary.

American Association of Industrial Physicians and Surgeons, Atlantic City, N. J., Oct. 5-6. Dr. Volney S. Cheney, Armour and Co., Union Stock Yards, Chicago, Secretary.

American Association of Obstetricians, Gynecologists and Abdominal Surgeons, Bretton Woods, N. H., Sept. 14-16. Dr. James R. Bloss, 418 Eleventh St., Huntington, W. Va., Secretary.

American Congress of Physical Therapy, New York, Sept. 7-11. Dr. Nathan H. Polmer, 921 Canal Street, New Orleans, Secretary.

American Hospital Association, Cleveland, Sept. 28-Oct. 2. Dr. Bert W. Caldwell, 18 East Division St., Chicago, Executive Secretary.

American Roentgen Ray Society, Cleveland, Sept. 29-Oct. 2. Dr. Eugene P. Pendergrass, 3400 Spruce St., Philadelphia, Secretary.

Central Association of Obstetricians and Gynecologists, Detroit, Oct. 15-17. Dr. Ralph A. Reis, 104 South Michigan Blvd., Chicago, Secretary.

Colorado State Medical Society, Glenwood Springs, Sept. 9-12. Mr. Harvey T. Sethman, 1612 Tremont Place, Denver, Executive Secretary.

Delaware, Medical Society of, Rehoboth, Oct. 12-14. Dr. William H. Speer, 917 Washington St., Wilmington, Secretary.

Idaho State Medical Association, Boise, Aug. 31-Sept. 4. Dr. Harold W. Stone, 105 North Eighth St., Boise, Secretary.

Indiana State Medical Association, South Bend, Oct. 6-8. Mr. Thomas A. Hendricks, 23 East Ohio St., Indianapolis, Executive Secretary.

Kentucky State Medical Association, Paducah, Oct. 5-8. Dr. Arthur T. McCormack, 532 W. Main St., Louisville, Secretary.

Michigan State Medical Society, Detroit, Sept. 21-24. Dr. C. T. Ekelund, 35 West Huron St., Pontiac, Secretary.

Mississippi Valley Medical Society, Burlington, Iowa, Sept. 30-Oct. 2. Dr. Harold Swanberg, 510 Maine St., Quincy, Ill., Secretary.

Nevada State Medical Association, Reno, Sept. 25-26. Dr. Horace J. Brown, 20 North Virginia St., Reno, Secretary.

Northern Minnesota Medical Association, Fergus Falls, Aug. 31-Sept. 1. Dr. Oscar O. Larsen, Detroit Lakes, Secretary.

Ohio State Medical Association, Cleveland, Oct. 7-9. Mr. C. S. Nelson, 79 East State St., Columbus, Executive Secretary.

Oregon State Medical Society, The Dalles, Oct. 8-10. Dr. Morris L. Bridgeman, 1020 S.W. Taylor St., Portland, Secretary.

Pennsylvania, Medical Society of the State of, Pittsburgh, Oct. 5-8. Dr. Walter F. Donaldson, 500 Penn Ave., Pittsburgh, Secretary.

Southern Minnesota Medical Association, Albert Lea, Aug. 30-31. Dr. Harold C. Habein, 402 Second Ave., Rochester, Secretary.

Virginia, Medical Society of, Staunton, Oct. 13-15. Miss Agnes V. Edwards, 1200 East Clay St., Richmond, Secretary.

Washington State Medical Association, Yakima, Aug. 31-Sept. 2. Dr. Vernon W. Spickard, 1303 Fourth Avenue, Seattle, Secretary.

Wisconsin, State Medical Society of, Madison, Sept. 8-11. Mr. J. G. Crownhart, 119 East Washington Avenue, Madison, Secretary.

Wyoming State Medical Society, Cody, Aug. 24-25. Dr. Earl Whedon, 50 North Main Street, Sheridan, Secretary.

Current Medical Literature

AMERICAN

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Titles marked with an asterisk (*) are abstracted below.

American J. Digestive Diseases and Nutrition, Chicago

3: 215-288 (June) 1936

Significance of Chronic Gastritis. J. W. Larimore, St. Louis.—p. 215.
Pancreatic Enzymes and Tissue Metabolism. H. C. Bradley and S. Belfer, Madison, Wis.—p. 220.
Influence of Bacteria Coli and Its Products on Motility of Strips of Excised Intestine. L. Weinstein and L. F. Rettger, New Haven, Conn.—p. 224.
Observations on Ulcerations Adjacent to Experimental Gastric Pouches in Dogs. A. Winkelstein, New York.—p. 229.
Ketosis as Measured by Ketonemia Following Fat Ingestion by Obese and Nonobese Patients. E. L. Keeney, J. W. Sherril and E. M. MacKay, La Jolla, Calif.—p. 231.
*Is Gastric Secretion or Digestion Impaired by a Mixture of Carbohydrate and Protein in the Diet? H. Shay, J. Gershon-Cohen and S. S. Fels, Philadelphia.—p. 235.
*I. Effect of Acetylsalicylic Acid on Gastric Activity and the Modifying Action of Calcium Gluconate and Sodium Bicarbonate. J. G. Schnedorf, W. B. Bradley and A. C. Ivy, Chicago.—p. 239.
Problems in Obstructive Jaundice Cases. D. P. MacGuire, New York.—p. 244.
Experimental Peptic Ulcer: Effect of Surgical Duodenal Drainage on Dogs and Value of Histidine in Preventing Ulcer. C. A. Flood and C. R. Mullins, New York.—p. 249.
Present Status of Radiation Therapy in Carcinoma of Anus, Rectum and Sigmoid Colon. H. E. Bacon, Philadelphia.—p. 255.

Effect of Carbohydrate and Protein on Gastric Secretion.—Shay and his co-workers studied five persons free of any organic gastro-intestinal disease by repeated fractional gastric analysis following meals of distilled water, a pure carbohydrate, a pure protein, and mixtures of the two. Four had a normal gastric acid response and one gave an achlorhydric response. The studies were done in order to test the validity of the claims made that mixtures of protein and carbohydrate interfere with proper gastric digestion. The gastric secretory studies included the usual titration of acidity to Töpfer's and to phenolphthalein, hydrogen ion determinations, total chlorides, and quantitative pepsin. Gastric digestion was followed by quantitative determinations of reducing substances and amino nitrogen in the separate fractions. More than 6,000 determinations were made on 900 fractional specimens. It was found that mixtures of carbohydrate and protein in the test meal do not in any way interfere with gastric secretion. Not only do these mixtures not interfere with gastric digestion, but carbohydrate digestion in the stomach is prolonged and encouraged by its mixture with protein. This is probably brought about by the more favorable reaction for continued ptyalin activity in the stomach as a result of the acid combining power of the protein. The same would be true following any regurgitation of pancreatic amylase from the duodenum.

Effect of Acetylsalicylic Acid on Gastric Activity.—Schnedorf and his collaborators found that in some normal human subjects and in normal dogs single oral doses (from 1 to 2 Gm.) of acetylsalicylic acid caused gastric retention; the addition of calcium gluconate tended to increase the degree of retention, while the addition of sodium bicarbonate increased the rate of gastric evacuation. Single oral doses of acetylsalicylic acid increased the total titrable acidity of the contents of the stomach; the addition of calcium gluconate diminished the rise in the acidity, while the addition of sodium bicarbonate decreased the acidity of the contents below that of the controls. In dogs with pouches of the entire stomach, the local application of acetylsalicylic acid caused a definite increase in the neutral chloride, or diluting secretion of the stomach, the addition of calcium gluconate resulted in only a slight increase in the diluting secretion, while the addition of sodium bicarbonate to the acetylsalicylic acid also resulted in only a slight increase in the diluting secretion. None of the solutions increased the formation of hydrochloric acid significantly. Prolonged daily administration of acetylsalicylic acid to normal dogs and to dogs with Pavlov stomach pouches resulted in definite augmentation of gastric secretion. With the addition of calcium gluconate the increase was not nearly so marked, while sodium bicarbonate and acetylsalicylic acid actually caused a decrease in the gastric secretion below the control values. The neutralizing and "inhibiting" actions of sodium bicarbonate and calcium gluconate on the titrable acidity of the gastric contents and on the output of hydrochloric acid may play a definite part in the ameliorating effects of these substances on the degree of gastric irritation and the incidence of ulceration produced by the prolonged oral administration of acetylsalicylic acid to dogs. Whereas the protective action of sodium bicarbonate may be adequately explained by a reduction of acid irritation, this is not true of calcium gluconate, the protective action of which against digestive disturbances appears to be due also in part to some systemic action of calcium. From the evidence available it would appear that, to obtain optimal protection when giving salicylates in large doses, the salicylates should be administered with sodium bicarbonate and calcium gluconate.

American Journal of Diseases of Children, Chicago

51: 1257-1500 (June) 1936

*Quantitative Wassermann Tests in Diagnosis of Congenital Syphilis: Clinical Importance of Fildes' Law. H. K. Faber and W. C. Black, San Francisco.—p. 1257.
Metabolism of Adolescent Girls: III. Excretion of Creatinine and Creatine. C. C. Wang, Ida Genther and Corinne Hogden, Cincinnati.—p. 1268.
Pneumonia in Infants and in Children: Bacteriologic Study, with Especial Reference to Clinical Significance. Rosa Lee Nemir, Elizabeth Torrey Andrews and Julia Vinograd, New York.—p. 1277.
Acute Appendicitis in Children. S. Nixon and B. Nixon, Indianapolis.—p. 1296.
Respiratory Metabolism in Infancy and in Childhood: XVII. Daily Heat Production of Infants—Predictions Based on Insensible Loss of Weight Compared with Direct Measurements. S. Z. Levine and M. A. Wheatley, New York.—p. 1300.
Growth of Oriental Child in San Francisco: Contrast. Mary I. Preston, San Francisco.—p. 1324.
*Thrombosis of Lateral Sinus and Jugular Bulb of Nonotitic Origin: New Diagnostic Sign. S. Karelitz, New York.—p. 1349.
Congenital Cardiac Anomalies in Infants: Report of Five Cases: (1) Accessory Ventricle, (2) Tetralogy of Fallot with Right Aortic Arch and Redundant Left Ductus Arteriosus, (3) Tetralogy of Fallot with Anomalous Band in Right Auricle, (4) Complete Transposition of Arterial Trunks and (5) Double Defect of Ventricular Septum. F. A. Hemsath, Wilmington, Del.; M. Greenberg, New York, and J. H. Shain, Boston.—p. 1356.

Diagnosis of Congenital Syphilis.—It is clear to Faber and Black that the quantitative Wassermann test gives an earlier clue to the absence of syphilitic infection than does the ordinary simple qualitative test. In seven of the eight presumptively nonsyphilitic babies the reaction to the initial routine Wassermann test was plus 3, but with the exception of that in one case the initial titer was low, giving an immediate indication that actual syphilis might not be present. This infant, with the initial high titer, may have been subjected to treatment had not the test on the seventh day shown a sharp reduction of the number of units of reagin to half the original figure. The progressive but very gradual decline was striking. When determined by the ordinary method, the Wassermann reaction remained plus 3 as late as the fifty-second day and was still plus 2 minus on the seventy-third. In other words, the clue of eventual negativity was given by the quantitative method on the seventh day and not until the seventy-third by the routine method. Complete and final proof that some or all of these infants may not still harbor syphilis in latent form has not been offered. They are serologically and clinically normal but must continue under periodic observation. The authors feel justified in withholding treatment in these and similar cases, first because no criterion remains for judging either the necessity of treatment or its results and secondly because arsphenamine therapy has serious risks, to which a nonsyphilitic person should not be subjected. These risks are greater than those of failing to treat a possibly but improbably present latent infection. They propose that the transmission of syphilitic reagin from mother to fetus without the transmission of syphilis itself is a soundly established phenomenon and one of sufficiently fundamental

importance to be designated by the name of its discoverer, Fildes. It is suggested that it be worded as follows: "Syphilitic reagin in the blood of the new-born infant is diagnostic not of syphilis in the infant but of syphilis in the mother."

Thrombosis of Lateral Sinus and Jugular Bulb.—Karelitz has observed two children in whom he believed that the source of sinus thrombophlebitis was not an otitic infection. In one case the condition was due to the spreading of a thrombus from the left lateral sinus to the healthy right side, and in the other two it was retrograde, from thrombophlebitis of the internal jugular vein. In each instance a peculiar engorgement of the tympanum was observed on the same side as that on which the sinus thrombosis was demonstrated at operation. He believes that in each instance the thrombophlebitis preceded the otitic manifestation, and he therefore wishes to present this picture of otitic congestion as a new sign of a new clinical condition, namely, retrograde sinus thrombophlebitis, which he thinks has heretofore been observed only at postmortem examination.

American Journal of Medical Sciences, Philadelphia

191: 741-884 (June) 1936

Interrelationships of Glands of Internal Secretion Concerned with Metabolism. C. N. H. Long, Philadelphia.—p. 741.
Studies in Diabetes Mellitus: IV. Etiology: Part I. E. P. Joslin, Boston; L. I. Dublin and H. H. Marks, New York.—p. 759.
*The "Gordon Test" for Hodgkin's Disease. J. D. Goldstein, Rochester, N. Y.—p. 775.
Hodgkin's Disease of the Lung. E. H. Falconer and M. E. Leonard, San Francisco.—p. 780.
Plasma Cell Leukemia: Consideration of Literature: Report of Case. A. J. Patek Jr. and W. B. Castle, Boston.—p. 788.
Effect of Roentgen Ray Irradiation on Platelet Production in Patients with Essential Thrombocytopenic Purpura Haemorrhagica. S. R. Mettier and R. S. Stone, with technical assistance of Katherine Purviance, San Francisco.—p. 794.
Postoperative Respiratory Complications: Occurrence Following 7,874 Anesthesias. E. A. Rovenstine and I. B. Taylor, New York.—p. 807.
Lag Phase in Early Congenital Osseous Syphilis: Roentgenographic Study. N. R. Ingraham Jr., Philadelphia.—p. 819.
Minor Blood Agglutinins and Their Relation to Posttransfusion Reactions. W. P. Belk, Philadelphia.—p. 827.
Effect of Injecting Certain Electrolytes into Cisterna Magna on Blood Pressure. H. Resnik Jr., M. F. Mason, R. T. Terry, Baltimore; C. Pilcher and T. R. Harrison, Nashville, Tenn.—p. 835.
*Blood Transfusion in Typhoid Fever. P. T. Lantin and F. S. Guerrero, Manila, P. I.—p. 850.

"Gordon Test" for Hodgkin's Disease. — Goldstein declares that seven of nine lymphogranulomatous nodes, when inoculated intracerebrally into rabbits, produced an encephalitic syndrome. In two instances, in which tissue was obtained from histologically established cases of Hodgkin's disease, this reaction was not obtained. From both, biopsy specimens were obtained on two occasions, and enough material was available at necropsy to permit making an adequate number of rabbit tests. Dosage and time of icebox storage of the suspensions varied, but all the inoculated animals remained free from abnormal neurologic manifestations. Of the control group of twenty lymph nodes, five were tuberculous and two came from patients with infectious mononucleosis. None of the control glands produced signs of encephalitis on inoculation into rabbits. The study suggests that the "Gordon test" may be of distinct value in the diagnosis of Hodgkin's disease, especially in instances in which the histologic observations are uncertain. A negative test at the present time has no diagnostic significance. It is apparent however that, to settle the question of possible "false positive tests," additional cases must be studied.

Blood Transfusion in Typhoid.—Lantin and Guerrero treated forty-one severe cases of typhoid with blood transfusion and thirty-four cases without. They succeeded in reducing the fatality from 47.05 per cent in the control cases to 24.39 per cent in the cases in which transfusion was performed. They remove 150 cc. of blood from the patient and immediately replace it by direct transfusion of 200 cc. of blood from a donor. They have repeated the blood exchange the day following or as often and as many times as required by the severity of the case after an interval of from two to four days. Sometimes they gave as many as seven transfusions. In cases in which there was intestinal hemorrhage they did not remove blood from the patient but proceeded at once to transfuse 200 cc. of blood from the donor. Intestinal hemorrhage in itself is a natural method of exsanguination. They base the rationale of their method of treatment on the principle of detoxication brought about by the withdrawal of blood from the patient and its immediate replacement with new blood from a donor. They believe that this procedure brings about a more rapid detoxication and an early neutralization of the poisons in the system, an immediate introduction of protective elements and the stimulation of the defenses of the body.

American J. Obstetrics and Gynecology, St. Louis

31: 911-1096 (June) 1936

*Excessive Uterine Bleeding of Functional Origin. L. Wilson and R. Kurzrok, New York.—p. 911.
Incidental Blindness in Pregnancy. D. W. de Carle, San Francisco.—p. 929.
*Relation of Retinal Changes to Severity of Acute Toxic Hypertensive Syndrome of Pregnancy. R. D. Mussey, Rochester, Minn.—p. 938.
Further End Results in Treatment of Carcinoma of Cervix, Including Report of Second Five Year Series. L. C. Scheffey and W. J. Thudium, Philadelphia.—p. 946.
Secondary Abdominal Pregnancy: Report of Ten Cases. P. J. Reel and T. F. Lewis, Columbus, Ohio.—p. 957.
Immediate and Remote Effect of Abdominal Cesarean Section. T. L. Montgomery, Philadelphia.—p. 968.
*Blood Loss During Normal Menstruation. Adelaide P. Barer and W. M. Fowler, Iowa City.—p. 979.
Roentgenotherapy of Chorionepithelioma. M. E. Davis and A. Brunschwig, Chicago.—p. 987.
Statistical Studies on Puerperal Infection: III. Analysis of 115 Deaths Due to Puerperal Infection. C. H. Peckham, Baltimore.—p. 996.
Study of Surface Bacteria of the New-Born and Comparative Values of Cleansing Agents. R. T. Potter and A. R. Abel, East Orange, N. J.—p. 1003.
Mechanics of Uterine Support and Position: II. Factors Influencing Uterine Position (Experimental Study). L. J. Harris, Toronto, Canada; W. F. Mengert and E. D. Plass, Iowa City.—p. 1009.
*Cutaneous Hemorrhage During Puerperium with Later Development of Acute Yellow Atrophy. M. L. Stone and J. J. Bunim, New York.—p. 1015.
Trichomonas Vaginalis Vaginitis: Clinical Study. Helen M. Angelucci, Philadelphia.—p. 1020.
Syncytial Degeneration in Normal and Pathologic Placentas. B. Tenney Jr., Boston.—p. 1024.
Treatment of Incomplete Abortion: Results in 1,971 Cases. W. H. Drane, Brooklyn.—p. 1029.
Variations in Glycogen Content of Vaginal Mucosa as Relative Index to Quantitative Amount of Ovarian Hormone Available in Organism. J. F. Krumm, Chicago.—p. 1035.
Spontaneous Rupture of Uterus. L. S. Schwartz and L. Kurzrok, Brooklyn.—p. 1038.
Peptic Ulcer Complicating Pregnancy. F. W. Mulsow and W. E. Brown, Cedar Rapids, Iowa.—p. 1041.
Value of Trendelenburg Position for Occult Prolapse of Cord. J. W. Bourland, Dallas, Texas.—p. 1043.
Ligation of Both Ureters, Unilateral Nephrostomy, Recovery. N. I. Slutsky, Brooklyn.—p. 1045.
Pituitary Shock. W. McMann, Danville, Va.—p. 1047.
Charles Delucena Meigs: Leader in American Obstetrics. H. Thoms, New Haven, Conn.—p. 1049.

Uterine Bleeding of Functional Origin.—Wilson and Kurzrok consider five types of functional bleeding: puberty, maturity, preclimacteric, ovulation, cyclic or anovulatory. Selected cases of functional bleeding are presented and these show that: 1. Functional uterine bleeding is completely independent of the type of endometrium. 2. Cystic and glandular hyperplasia of the endometrium persists long after the bleeding has stopped. 3. The cause of functional bleeding must be sought for in some extra-endometrial factor. A theory to explain both menstrual and functional bleeding based on the assumed presence of a bleeding factor (or hormone) in the anterior pituitary gland is suggested on the following hypothesis: 1. Bleeding alone is due to a special hormone elaborated by the anterior lobe of the hypophysis. 2. The bleeding hormone is separate and distinct from the follicle-stimulating and luteinizing hormones. 3. It is not gonadotropic but acts directly on the endometrium. 4. Its production is stimulated by the follicular hormone. 5. Its activity is inhibited but not destroyed by progestin. 6. The actual onset of bleeding occurs when a certain concentration of the bleeding hormone has been reached, provided its action is not inhibited by the corpus luteum hormone. 7. The bleeding stops when the bleeding hormone is exhausted.

Acute Toxic Hypertensive Syndrome of Pregnancy.—Mussey carried out ophthalmoscopic examination of the retinas of 108 patients who presented the acute toxic vascular (hyper-

tensive) syndrome of pregnancy. In 72 per cent of the cases in which the systolic blood pressure was 140 mm. of mercury or more, positive evidence was found of more or less change in the retinal arterioles or in the retina proper. As a rule, changes in the retina, which at first consisted of spastic narrowing of the retinal arterioles, showed a definite increase in degree and severity, with increase in the height of the systolic blood pressure and the duration of the toxemia. Information obtained by retinal examination of patients who present acute hypertensive toxemia of pregnancy is a distinct aid in determining if and when pregnancy should be terminated. It seems evident that, when the spastic condition of the retinal arterioles is maintained, the first appearance of cotton-wool exudates and hemorrhages in the retina indicates the danger of permanent systemic arteriolar injury; in the presence of such retinal changes, pregnancy should be terminated promptly.

Blood Loss During Normal Menstruation.—Barer and Fowler determined the menstrual blood loss in 100 normal women, whose ages ranged from 15 to 43 years. For the most part the subjects were members of the hospital staff who were in good health and whose menses were considered to be normal. Cellulo-cotton pads were utilized in the collection of the menstrual flow except for five individuals who employed vaginal cups. The iron content of the menstrual flow in the 100 women varied from 2.28 to 78.96 mg., which represents from 0.680 to 23.57 Gm. of hemoglobin. When these values are translated to terms of cubic centimeters of blood having a hemoglobin content equivalent to that of the particular individual's intravascular blood, they represent a loss of from 6.55 to 178.69 cc. The mean loss for the entire group was 50.55 cc., with a standard deviation of 25.73 cc. While the greater number of cases actually fell in the 20 to 30 cc. group, 50 per cent of the subjects lost between 23.21 and 68.43 cc. There was no correlation between the age of the individual and the amount of blood lost. There was, however, a difference between the blood loss in the unmarried (seventy-six cases, mean loss 52.96 cc.) and the married women (twenty-four cases, mean loss 42.91 cc.). The flow was more profuse in the parous than in the nulliparous subjects. There was no correlation between the blood loss and the blood hemoglobin in the subjects studied. As the duration of the period increases the average blood loss increases, but there are marked variations. While the menstrual loss has been reduced to terms of cubic centimeters of blood to give a more graphic description of the results, it is not the volume itself but the hemoglobin and iron content of the menstrual flow which is of vital importance. The loss of 2.28 mg. of iron per period would require a daily iron storage of 0.08 mg. to replace this loss alone. The results of iron balance studies, which are to be reported later, indicate that the latter amount is far greater than the average daily iron retention and may be attained only by the administration of iron in addition to that obtained from the diet. This continuous excessive iron loss may account for certain cases of hypochromic anemia which have been considered idiopathic in origin. While this may not be the only etiologic factor in all such cases, it undoubtedly plays an important and frequently an unrecognized part.

Cutaneous Hemorrhage During Puerperium with Development of Acute Yellow Atrophy.—Stone and Bunim report a case in which a primipara, aged 27, after a normal pregnancy and forceps delivery developed a purpuric eruption of peculiar distribution. Several weeks following complete recovery from this condition she developed acute yellow atrophy of the liver and died. The patient was tested for ergot but showed no hypersensitivity to it. Her past history of having taken castor oil as well as quinine on a number of previous occasions without untoward reactions excludes these drugs as possible antigens. Sensitivity to acacia has been reported both in experimental animals and in man. Unfortunately the patient was not tested with this antigen. However, following the appearance of purpura the patient was again given 300 cc. of acacia intravenously and no reaction followed. The question of the relationship, if any, between acute yellow atrophy and the purpura or the preceding pregnancy remains. The authors hesitate to consider the acute yellow atrophy a complication of the patient's pregnancy because more than five weeks elapsed between delivery and manifestations of her final illness, because during this intervening period there was an interval of perfect health and because sections of the liver showed no evidence of any regenerative processes. For the same reasons they hesitate to link the purpuric eruption with the later development of severe liver disorder.

American Journal of Public Health, New York

26: 561-664 (June) 1936

Attainable Standards in Bacterial Counts of Raw and Pasteurized Milk. M. E. Barnes, Iowa City.—p. 561.
Some Epidemiologic Aspects of Chronic Endemic Dental Fluorosis. H. T. Dean and E. Elvove, Washington, D. C.—p. 567.
Whooping Cough in Surveyed Communities. E. Sydenstricker and R. E. Wheeler, New York.—p. 576.
Dermatitis from Synthetic Resins and Waxes. L. Schwartz, New York.—p. 586.
Setup and Budget for Public Health Education. I. V. Hiscock, New Haven, Conn.—p. 593.
Veterinary Service in Control of Dairy Products. J. G. Hardenbergh, Plainsboro, N. J.—p. 597.
System of Codification of Medical Diagnoses for Application to Punch Cards, with a Plan of Operation. J. Berkson, Rochester, Minn.—p. 606.
Industrial Sanitation as Public Health Engineering Activity. C. L. Pool, Providence, R. I.—p. 613.
Cultural Methods of Isolation of Tubercle Bacilli. A. L. MacNabb, Toronto.—p. 619.
Integration of the School Health Program with Community Health Education. V. S. Blanchard, Detroit.—p. 625.
Preliminary Report of the Subcommittee on Educational Qualifications of Public Health Engineers. R. E. Tarbett.—p. 629.
Preliminary Report of the Subcommittee on Educational Qualifications of Sanitarians. R. E. Tarbett.—p. 632.

Annals of Surgery, Philadelphia

103: 863-1032 (June) 1936

Report of the Committee to Study Further Problems of Postgraduate Surgical Education in General and Qualifications for Specialization in General Surgery in Particular. E. A. Graham, St. Louis.—p. 863.
Bacteriologic Studies of Chronic Appendicitis: Based on 209 Consecutive Cases. D. C. Collins, Los Angeles.—p. 870.
Bile Tract and Acute Pancreatitis. C. R. Robins, Richmond, Va.—p. 875.
Presacral Nerve Resection for Relief of Pelvic Pain and Dysmenorrhea. J. E. Cannaday, Charleston, W. Va.—p. 886.
*Presacral Sympathectomy for Dysmenorrhea and Pelvic Pain. W. T. Black, Memphis, Tenn.—p. 903.
Total Hysterectomy: Review of 177 Cases. W. A. Bryan and C. C. Trabue, Nashville, Tenn.—p. 914.
Nephropexy for Disabilities Due to Abnormal Renal Mobility. P. G. Smith, G. F. McKim and T. W. Rush, Cincinnati.—p. 924.
Cautions in Treatment of Ureteral Calculi. O. Grant, Louisville, Ky.—p. 935.
Cysts of Testicle. I. Abell, Louisville, Ky.—p. 941.
Successful Operations for Hypospadias. W. Walters, Rochester, Minn.—p. 949.
End-to-End Vascular Anastomosis: Experimental Study. N. Winslow and W. W. Walker, Baltimore.—p. 959.
*Arteriovenous Aneurysm of First Portion of Right Subclavian Artery and Innominate Vein: Report of Case Successfully Operated On. I. Cohn, New Orleans.—p. 964.
Closed Reduction of Recent Dislocations of Semilunar (Lunate) Bone, with Results and Discussion Regarding Necrosis (Malacia): Report of Eleven Cases. H. E. Conwell, Birmingham, Ala.—p. 978.
Fractures of Humerus, with Particular Reference to Nonunion and Its Treatment. G. E. Bennett, Baltimore.—p. 994.
Diagnosis and Treatment of Osteomyelitis. W. B. Owen, Louisville, Ky.—p. 1007.

Presacral Sympathectomy for Dysmenorrhea.—Through resection of the presacral (hypogastric) nerve for the relief of dysmenorrhea and pelvic pain Black obtained excellent results in the majority of the twenty-seven cases that he cites. There were nine cases of the essential and eighteen of the acquired type of dysmenorrhea. Fifteen patients suffered from bladder disturbances (dysuria was severe in some and milder in character in others). There was definite pathologic change in ten cases. In fourteen retrodisplacements were corrected and appendectomy and sympathectomy were performed. Three had a diagnostic dilation and curettage and two a cauterization of the cervix, besides the sympathectomy. Postoperative catheterization was necessary in thirteen cases. Seven patients in this group had postoperative bleeding in two or three days (without pain in six, slight in one). Three had a single nerve, one a double nerve and the remainder a plexiform arrangement. Excellent results were obtained in twenty-one cases. A marked improvement was obtained in five cases. One patient could not be located. Dysmenorrhea was relieved practically 100 per cent.

Bladder symptoms were relieved immediately, but after a few months some complained of a burning on urination. This could be due to a recent gonorrheal infection, although one must consider the nerve supply to the urethra as a possible cause of continued complaint. Constipation was not relieved in a number of instances; however, in some it was corrected. The sympathetic nerve supply is so variable that failure to relieve constipation can be ascribed to this cause in some cases. Metrorrhagia was relieved in two cases. Presacral sympathectomy in addition to removing the pelvic pathologic changes in suitable cases of pelvic pain has increased the percentage of cures.

Aneurysm of Right Subclavian Artery and Innominate Vein.—Cohn discusses the case of a young man who had an arteriovenous aneurysm involving the first portion of the subclavian and possibly the innominate vein. He was tolerating well the existing aneurysm as evidenced by the following facts: the patient was stabbed in the right side of the neck eighteen months prior to admission (for external hemorrhoids); he had no symptoms indicative of general circulatory disturbance; the electrocardiographic observations were reported negative and the roentgen examination of the chest indicated no marked cardiac enlargement. There was, however, evidence of pulmonary disease, but tubercle bacilli were not found on repeated examinations prior to operation. There was evidence of an established collateral circulation, as the radial pulse was good and there was no muscular atrophy. The Branham bradycardiac phenomenon was not found on several occasions. The heart was only slightly enlarged, but the existing enlargement diminished following operation. Postoperatively the radial and brachial pulses have failed to return. In spite of this, the collateral circulation has been adequate to prevent evidence of atrophy or circulatory disturbance. The value of passive vascular exercise as an adjunct in developing collateral circulation is demonstrated by the good result. The operation consisted of ligation of the internal jugular vein, ligation of the right subclavian artery and the innominate vein on each side of the fistula and obliterative suture of the vein and artery at the site of the fistula. Cure of the aneurysm resulted. The arteriovenous fistula between the right subclavian artery and the innominate vein as existed in this case is evidently unique.

Archives of Dermatology and Syphilology, Chicago

33: 951-1104 (June) 1936

LXXIII: Cutaneous Torulosis. W. H. Mook and M. Moore, St. Louis.—p. 951.

*Pustular Psoriasis: Its Relation to Acrodermatitis Continua vel Perstans. F. A. Ellis, Baltimore.—p. 963.

Familial Xanthoma: Report on Three of Five Siblings with Xanthoma Tuberosum Multiplex. E. A. Levin and M. Sullivan, Cleveland.—p. 967.

Amyloidosis Cutis Lichenoides. O. S. Philpott and A. W. Freshman, Denver.—p. 970.

*Sphaceloderma: Report of Case of Unusual Phagedenic Ulceration of Skin, Subcutaneous Tissue and Muscle of Chest Wall. W. Sachs, Jersey City, N. J.—p. 977.

The Field of Dermatology: President's Address. W. A. Pusey, Chicago.—p. 987.

Bejel: Nonvenereal Syphilis. E. H. Hudson, Deir-ez-Zor, Syria.—p. 994.

Evaluation of Phytopharmacologic Test of Pels and Macht. L. Hollander and R. J. Greb, Pittsburgh.—p. 1012.

Therapeutic Timidity. D. W. Montgomery, San Francisco.—p. 1018.

An Acneform Dermatergosis. J. W. Jones and H. S. Alden, Atlanta, Ga.—p. 1022.

*Acne and Carbohydrates: Preliminary Report. G. M. Crawford and J. H. Swartz, Boston.—p. 1035.

Paradoxical Influence of Light Rays as Causative and as Curative Factor in Cancer of Skin. F. Blumenthal, Ann Arbor, Mich.—p. 1042.

J. Francis Aitken: Appreciative Sketch. P. E. Bechet, New York.—p. 1052.

Curability of Syphilis. J. E. Klein, Chicago.—p. 1055.

Increased Reactivity of Skin to Staphylococcus Toxin in Patients with Lupus Erythematosus. H. H. Hopkins and E. L. Burky, Baltimore.—p. 1060.

Pustular Psoriasis.—Although Barber seemingly gave a convincing, clear-cut differential diagnosis between acrodermatitis repens vel continua and pustular psoriasis, Ellis believes that occasionally a condition is seen which defies differentiation. A case of psoriasis is reported in which the condition was complicated by a unilateral superficial pustular eruption after severe frost bite of the hand. The eruption had the features which Barber considered characteristic of acrodermatitis continua. From the literature and the case reported, one must conclude either that acrodermatitis continua is a form of pustular psoriasis or that the patient had had acrodermatitis continua for ten years and psoriasis developed later.

Sphaceloderma.—Sachs describes a case of extensive ulceration, of spontaneous origin, in a girl, aged 10 years, showing no symptoms at any time. Laboratory investigation proved of little value, and the condition resisted all types of treatment. It started without any known cause and terminated after four years without apparent cause. The patient's general condition remained good throughout four years of observation. The osteomyelitis of the left humerus became progressively worse, the area was operated on and the necrotic granulations were curetted. She responded well to this, and the condition gradually improved. The wound remained more or less stationary for two years, with the occasional appearance of healthy granulations at several points. The wound has slowly but progressively improved, until at the time of writing the entire area has undergone epidermization. At no time before or during the healing was any special treatment used. The osteomyelitis is completely healed. She has no subjective symptoms and, other than impairment in motion, experiences no discomfort. There remains only a little motion in the left arm, owing to adhesions to the chest wall. The left breast is gone. On lateral view there is a marked concavity of the left side of the chest, causing considerable deformity of the thorax. The scar extends across the whole wall of the chest, the upper margin reaching to the top of the sternum in the center and on the sides and extending over the shoulders; the lower border reaches to the bottom of the chest wall. The scar extends down over the upper third of the right arm; on the left side it extends around the back, in the upper part to within 2 inches (5 cm.) of the spine and in the lower part to the lower pole of the scapula. Almost the entire left arm is covered by scar tissue. The edges of the scar are irregular, in places white, smooth and at the same level with the surrounding skin and in places raised, well defined and red. The surface is in part smooth except for a few cordlike red bands traversing it in different directions. In the region of the left shoulder and left arm the surface is very irregular, with large masses protruding. There are large fibrous bands connecting the left side of the chest wall and the upper half of the left arm. In part the scar is smooth, stretched, thin and glossy; in part it is wrinkled, dull and not unlike cigaret paper in appearance. Over the lateral surface of the left arm is a deep scar, at which point the incision was made because of the osteomyelitis. The history, course and laboratory observations rule out extensive ulcerations caused by tuberculosis, syphilis, actinomycosis, blastomycosis, sporotrichosis and coccidioidal granuloma. There was no history of the ingestion of drugs, especially iodides, before admission to the hospital. The wound healed, even though the patient was taking iodides. Antimony and potassium tartrate was given to the patient as a therapeutic test, with no results. The condition does not fit in with any of the types of gangrene described.

Acne and Carbohydrates.—Crawford and Swartz hospitalized ten patients with severe pustular acne who were given routine examinations, including the usual laboratory studies and dextrose tolerance tests, and the blood sugar content was again checked on dismissal. All the patients showed values for the blood sugar content in the lower range of normal at all times and gave normal reactions to dextrose tolerance tests. They were placed on a high intake of carbohydrates and were given daily intravenous injections of dextrose for two weeks. Half of the patients exhibited definite improvement, 20 per cent showed a slight improvement, and none were worse. Maintenance of this diet over periods up to one year has resulted in continued improvement in 50 per cent of the patients, with routine local measures as the only adjuvant. These results definitely intimate that a high carbohydrate regimen is not inimical to the welfare of patients with acne. It is possible that other types of foods or, perhaps, specific foods, are more to be incriminated as factors in cases of acne than the long abused carbohydrates.

Archives of Internal Medicine, Chicago

57: 1061-1252 (June) 1936

Clinical Experiences in Use of Determinations of Blood Iodine. E. P. McCullagh and D. R. McCullagh, Cleveland.—p. 1061.
Experimental Diabetes Insipidus in Monkey. W. R. Ingram, C. Fisher and S. W. Ranson, Chicago.—p. 1067.
Studies on Nitrogen and Sulfur Metabolism in Bright's Disease: VII. Sulfur Content of Urinary Protein. G. P. Grabfield and B. Prescott, Boston.—p. 1081.
*Hirsutism, Hypertension and Obesity Associated with Carcinoma of Adrenal Cortex: Indeterminate Pituitary Adenoma and Selective Changes in Beta Cells (Basophils) of Hypophysis. I. Graef, J. J. Bunim and A. Rottino, New York.—p. 1085.
Control of Hyperthyroidism Following Partial Thyroidectomy by Removal of Unusually Small Amounts of Thyroid Tissue. S. F. Haines and J. deJ. Pemberton, Rochester, Minn.—p. 1104.
*Generalized Discoloration of Skin Resembling Argyria Following Prolonged Oral Use of Bismuth: Case of "Bismuthia." H. C. Lueth, Evanston, Ill.; D. C. Sutton, C. J. McMullen and C. W. Muehlberger, Chicago.—p. 1115.
Tularemic Pneumonia, Pericarditis and Ulcerative Stomatitis. S. B. Pessin, Madison, Wis.—p. 1125.
Lymphedema (Elephantiasis) of Extremities Caused by Invasion of Lymphatic Vessels by Cancer Cells: Report of Two Cases. H. Montgomery, Rochester, Minn.—p. 1145.
Evaluation of Measures of Renal Function in Persons with Arteriosclerotic Bright's Disease. A. H. Elliot and F. R. Nuzum, Santa Barbara, Calif.—p. 1151.
*Differential Platelet Count: Its Clinical Significance. I. Olef, Boston.—p. 1163.
Blood: Review of Recent Literature. R. Isaacs, C. C. Sturgis, F. H. Bethell and S. M. Goldhamer, Ann Arbor, Mich.—p. 1186.

Obesity Associated with Carcinoma of Adrenal.—Graef and his associates believe that their case and the one reported by Mathias are the only ones recorded in which tumors have been found in the adrenal cortex and the anterior lobe of the pituitary gland of the same patient. Their patient, a girl 19 years of age, presented hirsutism, hypertension, obesity and atrophic striae in life and at necropsy was observed to have a metastasizing carcinoma of the adrenal cortex and an indeterminate miliary adenoma of the anterior lobe of the pituitary gland. Selective degenerative changes were noted in the nuclei of the beta cells of the anterior part of the hypophysis. Although data are not conclusive, evidence is given which tends to show that the pituitary adenoma is not merely a coincidental observation. Marked overexcretion of estrogenic substance in the urine was noted during life, and this is discussed with relation to the atresia and atrophy of the ovaries and endometrium. Clinical manifestations or pathologic evidence of changes in the pituitary gland in similar cases of metastasizing adrenal neoplasm have been found to coexist in (1) the case of a 24 year old man who had hypertension due to a tumor of the adrenal cortex and who had an acromegalic appearance (Oppenheimer and Fishberg), (2) a case of metastasizing carcinoma of the adrenal cortex in a man aged 45 in whom an acromegalic appearance developed while he was under observation during the last six months of life (Long and Gray) and (3) the 18 year old girl who had hypertrichosis with a well marked beard from the age of 3 years and at the age of 18 died of a metastasizing neoplasm of the adrenal cortex (Mathias).

Discoloration of Skin Following Use of Bismuth.—Recently Lueth and his associates observed a patient with a deep blue discoloration of the skin and mucous membranes who complained of severe diarrhea. At first the condition was considered to be argyria, but when the patient was questioned the possibility of bismuth poisoning appeared. A number of years before the patient had been told that he had a peptic ulcer. He thought the medicine given at that time was silver nitrate. Later diarrhea appeared. It had persisted for eighteen years, during which time he had ingested large amounts of bismuth salts. Histologic and chemical studies of the skin definitely excluded silver and established bismuth as the cause of the pigmentation. The term "bismuthia" is suggested for the condition. A rough though inaccurate estimate of the amount of bismuth in the skin of the entire body was made by means of the Du Bois table for surface area. The skin used for the biopsy was taken from one of the lightest areas; on the basis of its analysis about 82 mg. of bismuth was calculated to have been present in the entire skin.

Differential Platelet Count.—The preserving fluid that Olef employed for both total and differential platelet counting consisted of 1 Gm. of sodium metaphosphate, 0.5 Gm. of sodium chloride, 0.1 Gm. of dextrose and 100 Gm. of distilled water. Under optimal conditions the platelets in this solution, when observed with the oil immersion lens, appear as free-floating, isolated, clear, highly refractile bodies with numerous spinelike processes projecting from the periphery. The technic for the enumeration of the platelets is as follows: The palmar surface of the finger tip is punctured with an automatic lancet. The first drop or two of blood is discarded. A drop of the diluting fluid is then placed over the puncture wound before the blood reaches the surface of the skin, and the hand is quickly turned over so that the palmar surface is directed downward. After a sufficiently large drop of blood has escaped into the drop of diluent, the mixture is applied to the surface of a small quantity (3 or 4 drops) of diluting fluid contained in a paraffin cup. The mixture is stirred gently and then transferred by means of a paraffin-coated applicator to a glass slide; usually three preparations can be obtained, as the quantity of fluid in the cup yields 3 large drops. A coverslip is placed over each drop, and after the preparations have been allowed to stand for from ten to fifteen minutes a relative thrombocyte-erythrocyte count is made, the oil immersion lens being used. Sealing the edges of the preparations with liquid petrolatum will prevent air currents in them. An erythrocyte count is then done in the usual manner, and the absolute number of platelets per cubic millimeter is determined. With this method the average number of platelets per cubic millimeter in normal adults is about 500,000. The platelets as observed in wet preparations vary considerably in size. They can generally be divided into four distinct groups: group 1, about 1.8 microns; group 2, about 2.5 microns; group 3, about 3.6 microns, and group 4, consisting of irregular-shaped platelets. The behavior of the total and differential platelet counts in a number of important clinical conditions is presented and the significance of the deviations from the normal discussed. In conditions associated with thrombocytosis and at times in those associated with thrombopenia, the deviation from the normal in the differential platelet formula is usually due to an absolute or relative increase in the number of small platelets. The presence of increased numbers of the larger types of platelets is often associated with intense regenerative activity, abnormal function or hypoplasia of the megakaryocytes in the bone marrow. Normally functioning platelets are usually normal morphologically. Functionally, the smaller platelets are much more active than the larger types. The small juvenile platelets possess high agglutinating powers, and their presence in large numbers constitutes a significant factor in the causation of spontaneous thrombosis in conditions associated with thrombocytosis.

Canadian Medical Association Journal, Montreal

34: 609-732 (June) 1936

Histology of Thyroid Gland in Pregnancy. A. C. Abbott and J. Prendergast, Winnipeg, Manit.—p. 609.
*Hypertrophy of Palpebral Tarsus, Facial Integument and Extremities of Limbs Associated with Widespread Osteoperiostosis: New Syndrome. J. N. Roy, Montreal.—p. 615.
Surgical Treatment of Chronic Radiation Dermatitis. S. Gordon, Toronto.—p. 622.
Syphilis of Placenta. P. J. Kearns, Montreal.—p. 625.
Pentothal: New Intravenous Anesthetic. K. M. Heard, Toronto.—p. 628.
Cryptomyces Pleomorpha Has No Etiologic Relation to Carcinoma. Pauline Beregoff-Gillow, Montreal.—p. 634.
Effects of Betaine on Cholesterol and Bilirubin Contents of Blood Plasma in Diabetes Mellitus. I. M. Rabinowitch, Montreal.—p. 637.
The Unstable Colon. C. J. Tidmarsh, Montreal.—p. 641.
Tuberculosis and the Student Nurse. R. J. Collins and C. W. MacMillan, St. John, N. B.—p. 649.
Sedimentation Test in Pulmonary Tuberculosis: Review of 635 Cases. A. H. Duncan, Gravenhurst, Ont.—p 655.
The Physician and Modern Dietetics. M. A. Bridges, New York.—p. 659.
Observation on Use of Iron Preparations in Treatment of Anemia. J. T. Tweddell, Kingston, Ont.—p. 664.
Relation of Bronchiectasis to Paranasal Sinus Infection. G. E. Hodge, Montreal.—p. 666.
Subcutaneous Emphysema Complicating Tonsillectomy. L. J. Baker, Montreal.—p. 670.
Cancer: Effective Offensive (Evolution of Saskatchewan's Anticancer Campaign). E. E. Shepley, Saskatoon, Sask.—p. 672.

Hyperplastic Disturbance of Connective Tissues.—In summing up the salient features of the multiple lesions in his case, Roy finds that they present a hyperplastic and degenera-

tive disturbance of certain connective tissues—bones, periosteum of the long bones, skin and subcutaneous tissues of the face and extremities of the limbs, and, above all, of the tarsus of the eyelids. This observation allows him to describe a disease having for its manifestations a hypertrophy of the eyelids, of the integuments of the face and of the extremities of the limbs, and also of the bony system in general, caused most probably by an endocrine disturbance. Though appearing like acromegaly, this syndrome does not present any of the essential features of this disease. He is of the opinion that it is impossible to classify the syndrome of this patient in the category of any disorder described heretofore, whether osseous, cutaneous or palpebral. Consequently, he advances a hypothesis in regard to the etiology, a hypothesis based on endocrinologic knowledge and on certain morbid factors concerning the relations of the patient and the place of his birth. The patient belongs to a goitrous family; he was born and brought up in a locality in which hypertrophy of the thyroid is endemic. The hypertrophy of the palpebral tarsus, the integuments of the face and extremities of the limbs, as well as the hyperplastic fibrous osteoperiostosis should be attributed to an upset of endocrine function in direct relation with a hereditary vice transmitted by goitrous parents or acquired as a result of a local pathologic factor which maintained a hypertrophy probably associated with thyroid derivation. The author places in the forefront of this imbalance certain physiologic disorders of the thyroid and parathyroids. The nonprogressive character of the syndrome in his patient leads him to conclude that the disorder completed its course long ago. So far as the hypertrophy of the eyelids and integuments of the face is concerned, it is easy to come to the conclusion, on consideration of a photograph taken eight years after the first one, that the small difference observed in these two pictures is due to the progress of age rather than to the continuation of the pathologic process. So far as the hypertrophy of the palpebral tarsus is concerned, perhaps one should not totally ignore the ocular irritation produced by smoke, when the patient was 20 years old, an irritation which in the space of about two months necessarily resulted in a chronic conjunctivitis. The palpebral troubles made their appearance in the fall of the same year. This inflammation, in its turn, has perhaps participated in the development of such a strange disease of the tarsus, because the endocrine or humoral predisposition of the patient was of a nature to favor the reaction of fibrous hyperplasia.

Florida Medical Association Journal, Jacksonville

22: 563-610 (June) 1936

Present Day Conceptions in the Management of Prostatic Obstruction. L. M. Orr II and D. T. Rue, Orlando.—p. 573.
Coordination of Private Practice and Preventive Medicine. W. W. Bauer, Chicago.—p. 578.
Some Observations on Fractures Seen at Florida State Hospital. J. C. Robertson, Chattahoochee.—p. 582.
Treatment of Tuberculosis. E. C. Hood, Florence, S. C.—p. 586.
Pyelitis in Pregnancy. I. J. Strumpf, Jacksonville.—p. 589.

Illinois Medical Journal, Chicago

69: 477-564 (June) 1936

The Physicians and the Pharisees. C. B. Reed, Chicago.—p. 491.
The Social Security Act and Its Relation to the Medical Profession. T. V. McDavitt, Chicago.—p. 499.
Reciprocal Relations Between State Medical Societies. H. M. Camp, Monmouth.—p. 502.
Standardization of Activities of the Committee on Medical Economics of the Midwest and Northwest. F. L. Loveland, Topeka, Kan.—p. 510.
Diagnostic Value of X-Ray in Diseases of Chest. R. S. Berghoff, Chicago.—p. 524.
The Social Security Act and the Doctor. N. Genevieve Chipman, Savanna.—p. 527.
Standards for Private Sanatoriums for the Care of Patients with Nervous or Mental Diseases. S. H. Kraines, Chicago.—p. 530.
Bacteriology and the Public Health. F. O. Tonney, Chicago.—p. 533.
Principal Research Publications: Section of Technical Service and Research Board of Health. F. O. Tonney, Chicago.—p. 537.
The Novocaine Treatment of Simple Sprains. W. K. Jennings, Evanston.—p. 538.
Injuries of the Kidney: Remarks on Effects of Trauma in General on Urinary Infection and Stone Formation. V. J. O'Conor, Chicago.—p. 541.
Factors Involved in General Surgery. M. S. Underhill, Evanston.—p. 545.
The Orphanage. A. S. Sandler, Chicago.—p. 547.
Rôle of Splanchnoperipheral Balance in Etiology of Diarrhea. A. J. Nedzel, Chicago.—p. 549.

Johns Hopkins Hospital Bulletin, Baltimore

58: 333-382 (May) 1936

Differential Diagnosis of Disseminated Sclerosis from Other Forms of Multilocular Encephalomyelopathy: Comments on Recent Ideas Concerning Etiology and Treatment. L. F. Barker, Baltimore.—p. 335.
*Morphologic Changes in Blood Associated with Experimentally Produced Hepatic Damage. H. B. Shumacker Jr. and M. M. Wintrobe, Baltimore.—p. 343.
Dinitrophenol Poisoning: Unusual Case. H. Eichert, Baltimore.—p. 378.

Changes in Blood Associated with Hepatic Damage.—Shumacker and Wintrobe describe the blood changes in dogs and rabbits in which acute and chronic hepatic damage was produced by the administration of carbon tetrachloride. Polycythemia developed following the initial doses of carbon tetrachloride or after the dosage was abruptly and substantially increased. Refractive index determinations suggested that hemoconcentration may have played a part in the causation of the polycythemia. Occasionally the refractive index before polycythemia developed rose to values found during polycythemia. More conclusive as suggesting hemoconcentration is the increase in total plasma solids from 0.0761 to 0.0825 Gm. per cubic centimeter of plasma, which occurred in one dog during the period of polycythemia. In the rabbits similar polycythemia was observed. After injury to the liver was caused repeatedly and a chronic condition closely resembling cirrhosis was produced, anemia developed. This was usually normocytic in type, but in instances in which the liver damage was very severe and of long duration, macrocytic anemia occurred. In such instances the bone marrow was hyperplastic and macroblastic in type. It is suggested that the anemia may be the indirect result of liver damage and that the macrocytic anemia developed as the consequence of a fault in the internal metabolism of antianemic principle.

Journal Industrial Hygiene and Toxicology, Baltimore

18: 341-370 (June) 1936

Determination of Trichlorethylene in Air. H. M. Barrett, Toronto, Canada.—p. 341.
Plant Study of Urine Sulfate Determinations as Measure of Benzene Exposure. W. P. Yant, H. H. Schrenk and F. A. Patty, Pittsburgh.—p. 349.
Prevention of Anthrax Infection in Woolen Textile Processing. I. G. Macdonald, Cornwall, N. Y.—p. 357.
Contributions of J. S. Haldane to Industrial Hygiene. Y. Henderson, New Haven, Conn.—p. 363.

Journal of Lab. and Clinical Medicine, St. Louis

21: 883-992 (June) 1936. Partial Index

Hemography in Diagnosis of Appendicitis Based on 500 Cases. W. J. Crocker and Eleanor H. Valentine, Philadelphia.—p. 883.
Effect of Obstructive Jaundice on Blood Platelets of Rabbit. L. V. Dill, Durham, N. C.—p. 899.
Primary Carcinoma of Lung: Review of Thirty Cases. Carol M. Rice, Madison, Wis.—p. 906.
*Alleged Variabilities of Kahn and Wassermann Reactions from Meteorological Changes. Margaret F. Kelley and J. J. Short, New York.—p. 910.
Modification of Hematopoietic Function in Rabbit by Certain Cyclic Compounds. D. R. Climenko, New York.—p. 913.
*Sodium Citrate: Spirocheticide. R. S. Leadingham, Atlanta, Ga.—p. 922.
Rapid Universal Blood Stain: May-Gruenwald-Giemsa in One Solution. M. M. Strumia, Bryn Mawr, Pa.—p. 930.
Rapid Flocculation Method for Diagnosis of Syphilis: Final Report. F. Rytz, Minneapolis.—p. 934.
Technic for Obtaining Human Blood for Tissue Culture Experiments. J. T. King, Minneapolis.—p. 940.
Prolonged Preservation of Antigenic Specificity of Sheep Corpuscles Associated with Production of Marked Increase in Resistance to Hypotonic Solutions. Winifred Ashby, Washington, D. C.—p. 943.
Study of Relative Sensitivity and Specificity of Kolmer-Wassermann, Kahn and Eagle Precipitation Tests. F. Boerner, Marguerite Lukens and R. L. Gilman, Philadelphia.—p. 952.
Estimation of Phospholipid Content of White Blood Cells. E. M. Boyd, Kingston, Ont.—p. 957.
General Purpose Polychrome Blood Stain. W. A. Groat, Syracuse, N. Y.—p. 978.

Kahn and Wassermann Reactions and Meteorological Changes.—Kelley and Short declare that the extreme variations in serologic reactions for syphilis reported by Hoverson and Petersen and their wide divergences between the results of Kahn and Wassermann tests on identical specimens are contrary to their own and to common experience. That meteoro-

logical changes could account for such inconsistencies is not supported by the results of their study. Repetitions were in the majority of instances highly consistent with the original tests. If meteorological variations are such an important factor as Hoverson and Petersen assert, supporting evidence should not be difficult to find in the vast literature that has accumulated on the subject of Wassermann and Kahn reactions. Hoverson and Petersen should look elsewhere for a satisfactory explanation of their results.

Sodium Citrate: Spirocheticide.—While preparing for darkfield examination a rather thick cover glass specimen from a laryngeal lesion of Vincent's angina, containing many pus cells and a bacterial flora consisting mainly of myriads of Vincent's organisms, Leadingham observed that the addition of a drop of a 2 per cent solution of sodium citrate caused immediate cessation of movement of the spirochetes and apparently eventful dissolution. Repeated examinations gave the same results. Later the same solution was applied to the surface of the ulcer from which the specimen had been taken. Ten minutes later no Vincent's organisms were found. None were present the next day or the day following, when the patient was dismissed.

Journal of Pharmacology & Exper. Therap., Baltimore

57: 113-198 (June) 1936

Comparative Actions of Sympathomimetic Compounds: Bronchodilator Actions in Bronchial Spasm Induced by Histamine. W. M. Cameron and M. L. Tainter, San Francisco.—p. 152.
Effect of Morphine Sulfate and of Dihydromorphinone Hydrochloride on Antrum, Pyloric Sphincter and Duodenum in Nonanesthetized Dogs. C. M. Gruber, J. E. Thomas, J. O. Crider and J. T. Brundage, Philadelphia.—p. 170.
Action of Certain Choline Derivatives on Coronary Flow. A. M. Wedd, Rochester, N. Y.—p. 179.
Effect of Certain Salicyl Derivatives on Isolated Hearts of Frogs and Turtles. R. L. Johnston, Cincinnati.—p. 193.

Journal of Thoracic Surgery, St. Louis

5: 453-566 (June) 1936

Complementary Anterior Thoracoplasty for Pulmonary Tuberculosis: Technic Employing Parasternal Division of Costal Cartilages. C. Haight, Ann Arbor, Mich.—p. 453.
Consideration of Contralateral Pneumothorax as Complication of Intrathoracic Operations. H. B. Stephens, San Francisco.—p. 471.
*Negative Sputum. M. Pinner, Oneonta, N. Y., and M. T. Wooley, Tucson, Ariz.—p. 476.
Cavity Closure by Combined Pneumothorax and Phrenic Nerve Interruption. C. M. Miller, Olive View, Calif.—p. 481.
Phrenic Exeresis at Termination of Pneumothorax Therapy. R. A. Bendove and L. R. Davidson, New York.—p. 487.
Phrenico-Exeresis. G. W. Weber, J. J. Jacobson and F. W. Holcomb, Kingston, N. Y.—p. 496.
Acute Dilatation of Stomach Following Left-Sided Phrenic Paralysis and Thoracoplasty: Two Fatal Cases and Two Cured by Continuous Gastric Suction. C. A. Thomas and F. R. Harper, Tucson, Ariz.—p. 507.
Anesthesia in Thoracic Surgery, with Especial Reference to Cyclopropane. U. H. Eversole and R. H. Overholt, Boston.—p. 510.
Technic of Experimental Coronary Sinus Ligation. L. Blum and L. Gross, New York.—p. 522.
*Rib Fracture from Cough: Report of Twelve Cases. W. R. Oechsli, Olive View, Calif.—p. 530.
Pharyngocele (Pulsion Diverticulum): Report of Case. H. Lilienthal, New York.—p. 535.
Chylothorax Due to Bullet Wound of Thoracic Duct and Syndrome of Traumatic Chylothorax: Report of Case, and Seven Cases from Literature. A. Strauss, Cleveland.—p. 539.
Matched Set of Periosteal Elevators. R. H. Overholt, Boston.—p. 552.
Continuous Automatic Water Suction Apparatus for Aspirating Cavities. W. S. Glazer, Detroit.—p. 557.
Pneumothorax Decompressor. B. Gordon, Philadelphia.—p. 560.

Negative Sputum.—On the basis of a numerical comparison of various methods for the demonstration of tubercle bacilli, Pinner and Wooley show that the unqualified term "negative sputum" is practically meaningless. Many patients whose sputum is found negative on repeated direct smears and concentrations expectorate bacilli that can be demonstrated by cultural methods and guinea-pig inoculation, by the use of laryngeal smears and gastric lavage and by appropriate methods of sputum collection. Following collapse therapy, and particularly following thoracoplasties, the roentgenologic evidence of healed cavities is often misleading and always inconclusive unless confirmed by the absence of sputum or the absence of tubercle bacilli according to the strictest tests. It is urged not to use the term "negative sputum" without stating specifically the criteria that were used to establish the absence of tubercle bacilli.

Rib Fracture from Cough.—During the last three years Oechsli has looked for rib fractures as a part of the routine interpretation of roentgenograms of the chest. Among about 2,000 admissions, twelve instances of fracture involving from one to four ribs have been observed, an incidence of 0.6 per cent. Fracture in all twelve cases was due to cough. Fracture was associated with far advanced tuberculosis in all but one patient, who had bronchial asthma and bronchitis. Induced pneumothorax was present in four instances and phrenic paralysis in one case. Three of nine unilateral fractures were associated with tuberculosis in the lung on the same side, three in the lung on the opposite side, two with bilateral tuberculosis and one with asthma. Of the three patients with fractures on both sides, two had tuberculous lesions in only one lung. Of the unilateral fractures, five were right sided and four left sided. Of the total of eighteen individual fractures experienced by the twelve patients, nine were right sided. In the light of these figures, one cannot ascribe much splinting effect to the liver. The appearance of the ribs was normal in every instance, and healing was fairly prompt, depending on the treatment afforded. There was no evidence of bone atrophy or calcium absorption. Muscular action is the determining factor in the occurrence of these fractures. A typical history is that, during a severe coughing spell, the patient notices a "catch" or "stabbing pain" in a sharply localized area, which he can point out accurately and which later is found to be the site of fracture. The usual signs and symptoms of fracture are elicited. Without exception, the fractures were found in a line extending from a point about 4 cm. from the costochondral articulation of the fourth rib obliquely caudad and laterally to the ninth rib in the midaxilla. This location corresponds to the heavy muscular attachments of the obliquus externus abdominis, where it interdigitates with the serratus anterior. In six of the author's cases the muscles attached to the shoulder girdle and to the chest wall were tense at the same time that the abdominal muscles were in strong contraction in the expiratory phase of coughing. It seems possible that contraction or tension of the shoulder girdle muscles, particularly the serratus anterior, exerting a pull laterally and cephalad, as opposed to the simultaneous pull of the abdominal muscles mesiad and caudad, may be the determining factor in this type of fracture.

Military Surgeon, Washington, D. C.

78: 413-490 (June) 1936

Treatment of Nonunion With or Without Loss of Bone. F. H. Albee.—p. 413.
The Third Pan-American Conference of National Directors of Health. B. J. Lloyd.—p. 427.
Observations on Preventive Medicine in the Tropics. S. F. Seeley.—p. 433.
Study of Pes Planus. H. L. Wheeler.—p. 438.
Shoes versus Feet. F. J. Vokoun.—p. 447.
Treatment of Neurosyphilis. T. C. C. Fong.—p. 449.
Surgical Treatment of Pulmonary Tuberculosis. J. H. Forsee.—p. 456.
X-Ray of Normal Chest: What Structures Underlie Shadows in Normal Chest Plate? M. Kasich.—p. 466.

Minnesota Medicine, St. Paul

19: 343-414 (June) 1936

Rocky Mountain Spotted Fever in Minnesota: Report of Second Indigenous Case and Biologic Studies. H. A. Reimann, Minneapolis.—p. 343.
Acute Coronary Thrombosis Without Characteristic Pain and Without Symptoms of Shock: Report of Three Cases. H. L. Smith and J. R. Brink, Rochester.—p. 346.
Ambulatory Treatment of Auricular Fibrillation with Quinidine: Five Year Follow-Up Study. S. A. Weisman, Minneapolis.—p. 349.
Huge Ovarian Cysts. C. W. Mayo and H. W. K. Zellhoefer, Rochester,—p. 353.
Ovulation Pain. R. N. Andrews, Mankato.—p. 355.
Hormone Effects in Women. E. C. Hartley, St. Paul.—p. 357.
*Clinical Significance of Ovarian Cysts. Selma C. Mueller, Duluth.—p. 361.
Surgery in Chronic Sinus Disease. F. L. Bryant, Minneapolis.—p. 364.
Primary Operation for Suppuration of Petrous Pyramid: Report of Two Cases. H. L. Williams, Rochester, Minn.—p. 367.
Diagnosis and Treatment of Acute Intestinal Obstruction. H. W. Quist, Minneapolis.—p. 372.
Varicose Veins of Broad Ligaments. C. H. Mattson, St. Paul.—p. 376.

Significance of Ovarian Cysts.—In an attempt to determine what proportion of ovarian tumors, particularly cysts, cause functional abnormalities as shown by changes in the menstrual cycle, Mueller studied 186 cases that had a diagnosis

involving the ovary, with or without other diagnoses. Of these, 169 were diagnosed cyst, cystic change or corpus luteum cyst, with or without associated lesions. Fourteen were malignant ovarian tumors, four pseudomucinous cysts, five carcinomas of the ovary, four papillary cystadenomas, one sarcoma, eight parovarian cysts, four dermoids, two "multilocular" cysts, two chocolate cysts, one endometrial cyst, one fibroma and one fibrosis of the ovary. In thirty-nine cases, more than one type of cyst was mentioned, or the cyst was associated with inflammatory changes in the tubes, ovaries or appendix. The ages of the patients varied from 15 to 77 years. The oldest patient had a benign ovarian cyst, while one of the 15 year old patients was operated on for a pseudomucinous cyst weighing 8,100 Gm. This patient died of a pulmonary embolus. In reviewing the histories of these patients, particular attention was paid to the menstrual cycle: 102 patients gave a history of regular, normal menses, seventeen were past the menopause and twenty-one gave a history of regular menses but stated that the flow was somewhat more profuse than normal. Thus, 140 of these patients gave a history of regular menses. Only forty of the entire series gave a history of irregular menses. Of these, fourteen had a diagnosis of only "cyst" or "corpus luteum cyst," without any other pelvic diagnosis. The remaining twenty-six had additional diagnoses, such as fibroids, cervical polyps, salpingitis and appendicitis. There were four tubal pregnancies included in this group. Infection, either of the fallopian tubes or of the appendix, was found in twenty patients having irregular and profuse menstrual flowing. In only fourteen cases was there no complicating factor, such as infection, fibroids or polyps. Inflammatory lesions, such as salpingitis and oophoritis and appendicitis, were associated with irregularities of menstruation in more than half of the cases showing this irregularity. The present conception of the pathologic physiology underlying functional uterine bleeding is that a lack of the luteinizing hormone of the anterior pituitary exists. This allows the follicular hormone to act without the luteinizing hormone, and the endometrial hyperplasia so induced results in hemorrhage. In addition to hormone therapy, stimulating doses of x-rays to the pituitary and ovary have been found beneficial in certain of the functional metrorrhagias and amenorrheas. Theoretically the old treatment of bimanual palpation and rupture of a single ovarian cyst found on pelvic examination would be good treatment if followed by other measures and if the diagnosis could be definitely established, but occasionally serious error might result and malignant lesions or other complications be overlooked.

Nebraska State Medical Journal, Lincoln

21: 241-280 (July) 1936

Maternal Mortality. J. R. McCord, Atlanta, Ga.—p. 241.
Introduction to Symposium on Hemorrhages of Pregnant Uterus. P. Findley, Omaha.—p. 245.
The Management of Abortion. C. F. Moon, Omaha.—p. 246.
The Management of Placenta Praevia. E. C. Sage, Omaha.—p. 247.
Management of Placentae Abruptio. R. Luikart, Omaha.—p. 250.
Other Causes of Bleeding in Pregnancy. L. O. Hoffman, Omaha.—p. 253.
Progress of Surgery: Review of Literature for the First Half of 1936. H. H. Davis, Omaha.—p. 255.
Infectious Mononucleosis. A. S. Rubnitz, Omaha.—p. 259.
A Few Remarks Concerning Treatment of Appendicitis. J. M. Willis, McCook.—p. 264.
Treatment of Angina Pectoris and Congestive Heart Failure by Total Ablation of Thyroid Gland. J. D. Bisgard, Omaha.—p. 267.

New England Journal of Medicine, Boston

214: 1173-1228 (June 11) 1936

Acute Cholecystitis: Study of Conservative Treatment. C. D. Branch and R. Zollinger, Boston.—p. 1173.
From Cow-Path to State Road. R. Fitz, Boston.—p. 1178.
*Hereditary Aspect of Progressive Pseudohypertrophic Muscular Dystrophy. G. deN. Hough Jr., Springfield, Mass.—p. 1189
Myxedema Following Removal of Aberrant Thyroid Tumor. J. G. Probstein and H. Agress, St. Louis.—p. 1191.
Recent Progress in Physiology. P. G. Stiles, Boston.—p. 1193.

Hereditary Aspect of Pseudohypertrophic Muscular Dystrophy.—Hough declares that the pedigrees of families having progressive muscular dystrophy reported in the literature show that the hereditary transmission may be as a dominant, a recessive or a sex-linked characteristic. He cites a family history presenting six cases of the disease, one of which is uncertain. Seventy-nine known individuals are recorded. The transmission was in all cases in this family through an apparently normal female. There is increasing evidence to substantiate Barker's statement that the facioscapulohumeral or Landouzy-Déjerine type of progressive muscular dystrophy is transmitted as a dominant characteristic. As these individuals frequently live to sexual maturity, they should be warned against having offspring. The more common pseudohypertrophic or Duchenne type of progressive muscular dystrophy is apparently transmitted through the clinically normal female members of the family, exactly as is hemophilia. Perhaps this is due to the fact that individuals with this type of the disease are almost always incapacitated before sexual maturity. There is sufficient evidence to prohibit reproduction by the apparently normal females in such a family, but to permit offspring to the apparently normal males. The method of inheritance may be used as a basis of sound classification, as it is directly concerned with the prevention of the condition. The varying types of hereditary transmission as well as other evidence seem to prove conclusively that these cases are not all one disease entity.

Northwest Medicine, Seattle

35: 203-242 (June) 1936

Recent Studies in Nutritional Requirements of Man. E. N. Todhunter, Pullman, Wash.—p. 203.
Vitaminized Foods and Commercial Vitamin Concentrates. I. A. Manville, Portland, Ore.—p. 209.
Specific Influences of Dietetic Fundamentals on Clinical Entities in Internal Medicine. C. H. Hofrichter, Seattle.—p. 215.
First Infection Type of Tuberculosis in Young Adult Life. J. A. Myers, Minneapolis.—p. 218.
Congenital Cyst of Lung: Report of One Case. C. R. Jensen, Seattle.—p. 222.
Response of Body to Infection: Immunity and Fever. L. A. Crandall Jr., Chicago.—p. 223.
Gastric Motility Following Subtotal Gastrectomy. J. H. Berge, Seattle.—p. 227.
*New Principle in Treatment of Perforated Peptic Ulcer: Preliminary Report and Case History. P. E. Spangler, Portland, Ore.—p. 229.

Treatment of Perforated Peptic Ulcer.—Spangler reports a case of perforated gastric ulcer in which the course was unusually benign. The explanation lies in the neutralization of the irritant hydrochloric acid by copious quantities of sodium bicarbonate solution ingested (twelve glasses) by the patient. This suggests the possible new principle in the treatment of perforated peptic ulcers, that is, alkaline therapy by mouth prior to operation, and intra-abdominal alkaline therapy during the operation directed toward complete neutralization of the irritant hydrochloric acid. Laboratory demonstration in experimental animals of the innocuousness of sodium bicarbonate solution in the peritoneal cavity and the demonstration of the effective intraperitoneal neutralization of gastric hydrochloric acid by sodium bicarbonate solution is necessary. In the light of this experience the author would not hesitate at any time in a similar case to aspirate stomach contents and wash the stomach with alkaline solution, and to allow it to remain in the stomach.

Pennsylvania Medical Journal, Harrisburg

39: 561-664 (May) 1936

Cancer of the Breast, with Particular Reference to Irradiation as Factor in End Results. A. Graham, Cleveland.—p. 561.
Diagnosis and Treatment of Cancer of Bladder by Means of Roentgen Ray. G. E. Pfahler, Philadelphia.—p. 572.
Modern Treatment of Human Infertility. B. Green, Philadelphia.—p. 576.
Outstanding Signs and Symptoms in Sinus Thrombosis: Merits and Demerits of Internal Jugular Ligation in Treatment of Lateral Sinus Thrombosis. M. S. Ersner and D. Myers, Philadelphia.—p. 579.
Eradication of Diphtheria in Pennsylvania. H. J. Benz, Pittsburgh.—p. 585.
Practical Consideration of Carcinoma of Skin. C. L. Schmitt, Pittsburgh.—p. 587.
Spinal Cord Tumors. F. C. Grant, Philadelphia.—p. 591.
Vesicovaginal Fistula. J. N. White, Scranton, Pa.—p. 594.
History and Recollections of Development of Pediatrics in Philadelphia. J. P. C. Griffith, Philadelphia.—p. 597.
Further Studies on Thymus and Pineal Glands. L. G. Rowntree, J. H. Clark, A. Steinberg, N. H. Einhorn, Philadelphia, and A. M. Hanson, Faribault, Minn.—p. 603.

Public Health Reports, Washington, D. C.

51: 643-684 (May 22) 1936

Sickness Among Male Industrial Employees During Final Quarter of 1935 and Entire Year. D. K. Brundage.—p. 643.
Engineering Control of Occupational Diseases. J. J. Bloomfield.—p. 655.
Chemical Studies on Tumor Tissue: III. Titration of Mouse Tumors. M. J. Shear.—p. 668.

51: 685-730 (May 29) 1936

Preparation of Concentrate of Vitamins B_1 and B_2 from Brewers' Yeast. M. I. Smith and A. Seidell.—p. 685.
Application of Preliminary Sanitary Survey to Flooded Areas. J. M. Dalla Valle and J. J. Bloomfield.—p. 688.
Rat-Proof Construction and Its Effect on Control of Rat Life on Ships: Instances of Permanent and Apparent Automatic Control Effected by This Type of Construction Observed on Fifty Ships at the Port of New York. B. E. Holsendorf.—p. 693.

51: 731-756 (June 5) 1936

Smallpox Immunity in 5,000 College Students. R. C. Bull and S. L. Rankin.—p. 734.

51: 757-798 (June 12) 1936

Development of Technic for Measuring Knowledge and Practice of Midwives. M. Derryberry and Josephine Daniel.—p. 757.
*Anemia of Deaminized Casein. M. I. Smith and E. F. Stohlman.—p. 772.

Anemia of Deaminized Casein.—Smith and Stohlman found that deaminized casein has little if any nutritional value in the nutrition of the white rat. When fed at a level of 10 per cent, deaminized casein produces in the white rat a characteristic macrocytic megaloblastic anemia with many Howell-Jolly bodies. The inclusion of good quality protein does not prevent the pathologic process, though it mitigates the severity of the anemia. Boiling deaminized casein with alcoholic sodium hydroxide, or reprecipitation of deaminized casein from aqueous alkaline solution, destroys the anemia-producing factor to a considerable extent. The intraperitoneal injection of the alcohol soluble fraction of a hydrochloric acid hydrolysate of deaminized casein reproduced the anemia definitely enough to prove conclusively that the anemia is an intoxication and not a deficiency disease.

Rhode Island Medical Journal, Providence

19: 83-96 (June) 1936

Bronchiectasis. J. M. Beardsley, Providence.—p. 83.
Peroral Endoscopy as an Aid in Diagnosis of Diseases of Bronchi and Esophagus. L. C. Happ, Providence.—p. 89.

Science, New York

83: 533-562 (June 5) 1936

*Potassium: Basal Factor in Syndrome of Cortico-Adrenal Insufficiency. R. L. Zwemer and R. Truszkowski, New York.—p. 558.
Differential Staining of Thick Sections of Tissues. Madeline Kneberg, Chicago.—p. 561.

Potassium and Cortico-Adrenal Insufficiency.—Zwemer and Truszkowski endeavored to find whether adrenal insufficiency is necessarily associated with disturbances in potassium metabolism, whether the symptoms of adrenal insufficiency can be reproduced in normal animals by raising the plasma potassium to the same extent by injection and what the mechanism is whereby the adrenal cortex regulates potassium metabolism. They believe that an important function of the adrenal cortex is the regulation of potassium metabolism and that the various known symptoms of cortico-adrenal insufficiency may be explained in terms of a disturbance of cortico-adrenal-potassium interrelations. It is further considered that the beneficial action of adrenal cortex extract in certain other pathologic conditions would suggest that the same mechanism is involved.

South Carolina Medical Assn. Journal, Greenville

32: 117-144 (May) 1936

The Relationship of the Clinical Pathologist to the Medical Profession at Large. J. M. Feder, Anderson, S. C.—p. 117.

32: 145-162 (June) 1936

Relation of Nutritional Deficiencies to Development of Heart Failure in Organic Heart Disease. W. B. Porter, Richmond, Va.—p. 145.
Study of Hookworm Disease. G. R. O'Daniel, Hartsville.—p. 151.
The Ammoniacal Diaper. D. O. Rhame Jr., Clinton.—p. 153.
Report of Spider Bite. H. L. Shaw, Sumter.—p. 155.

Southern Medical Journal, Birmingham, Ala.

29: 547-650 (June) 1936

Rabies: Continuing Challenge. J. N. Baker, J. G. McAlpine, Montgomery, Ala., and J. D. Dowling, Birmingham, Ala.—p. 547.
Some Important Factors That Influence Morbidity and Mortality in Gynecologic Surgery: Based on Review of 1,000 Consecutive Private Cases. J. T. Sanders and T. B. Sellers, New Orleans.—p. 557.
Symptomatic Mimicry of Gastro-Intestinal Diseases by Lesions of Genito-Urinary Tract. C. L. Hartsock, Cleveland.—p. 566.
The Management of Heart Disease in Pregnancy. J. Jensen, St. Louis.—p. 572.
Prolonged Barbiturate Narcosis in Treatment of Acute Psychoses. G. F. Witt and T. H. Cheavens, Dallas, Texas.—p. 574.
Neurologic and Psychiatric Manifestations of Malaria. C. C. Turner, Memphis, Tenn.—p. 578.
Use of Oxygen in Mobilization of Stiff Joints. E. B. Henson, Charleston, W. Va.—p. 586.
Acute Osteomyelitis: Etiology, Symptoms, Diagnosis and Treatment of Eighty Cases. J. I. Mitchell, Memphis, Tenn.—p. 588.
Indications for External Ethmosphenofrontal Sinus Operation. W. L. Simpson, Memphis, Tenn.—p. 594.
Chief and Most Common Cause of Nasal and Upper Dental Deformities. G. E. Adkins, Jackson, Miss.—p. 603.
Present Day Status of Irradiation and Surgery in Malignant Disease About Head and Neck. J. C. Beck and M. R. Guttman, Chicago.—p. 606.
Local Nonsurgical Management of Various Types of Glaucoma. J. Green, St. Louis.—p. 609.
Comparative Study of Bacillus Coli-Mutabile from Outbreak of Diarrhea in the New-Born. I. D. Michelson and Anna Dean Dulaney, Memphis, Tenn.—p. 611.
Blood Groups and Allergy: Statistical Review. L. Y. Dyrenforth, Jacksonville, Fla.—p. 617.
Unilateral Renal Agenesis: Case Reports of Unilateral Renal Aplasia and Congenital Absence of One Kidney. T. Ainsworth, Jackson, Miss.—p. 619.
Submucous Fibrosis of Urinary Bladder. W. R. Barron, Columbia, S. C.—p. 623.
Treatment of Uterine Carcinoma. K. C. Morin, St. Louis.—p. 624.
*Calcium Metabolism and Therapy in Dermatology. E. S. Lain, Oklahoma City.—p. 626.
Hernia and Its Effect on the Industrial Worker. Coral R. Armentrout, Houston, Texas.—p. 630.
A Few Health Problems Awaiting Solution. J. A. Ferrell, New York.—p. 635.
Proctology for the General Practitioner. R. D. Alexander, St. Louis.—p. 638.
The Saint Philip Hospital Postgraduate Clinic for Negro Physicians: Five Year Report. L. E. Sutton Jr., Richmond, Va.—p. 640.

Calcium Metabolism and Therapy in Dermatology.—Lain finds that the most gratifying effects of adequate and properly administered calcium therapy are that: 1. It produces a degree of sedation and stability of the sympathetic nervous system, thereby serving to give immediate relief in most acute or chronic pruritic dermatoses. 2. It limits to a striking degree exudation from either mucous or cutaneous structures, whether the irritant is due to internal or to external factors. 3. Administered intravenously, after the first flush of warmth passes away it gives immediate tone to the tissues, both cutaneous and muscular. There soon occurs a feeling of well being somewhat like that from a narcotic drug, without the unpleasant after-effects. 4. When it is given in conjunction with viosterol and foods high in vitamin D value, with an adequate exposure to ultraviolet radiation, it promises to be of special value in other skin eruptions which have for their etiologic background disturbed calcium metabolism. 5. By making this presentation, the author hopes to stimulate more interest among dermatologists for a closer cooperation between the physiologic laboratory and the clinician, whereby the establishment of calcium therapy on a rational basis with a full knowledge of its values and limitations may become a reality.

Southern Surgeon, Atlanta, Ga.

5: 179-254 (June) 1936

Occurrence of Convulsions in Series of Over 700 Verified Intracranial Tumors. L. T. Furlow and E. Sachs, St. Louis.—p. 179.
What Can We Expect from Radical Surgery for Rectal and Rectosigmoidal Cancer? F. W. Rankin, Lexington, Ky.—p. 192.
Recent Developments in Surgery of Sympathetic Nervous System. P. G. Flothow, Seattle.—p. 200.
Dyschondroplasia: Consideration of Osseous Dystrophies. H. R. Mahorner, New Orleans.—p. 209.
Instrument for Treatment of Trigeminal Neuralgia by Electrocoagulation. H. H. Cooke, Miami, Fla.—p. 224.
Technic for Injection Treatment of Hernia. C. O. Rice and L. M. Larson, Minneapolis.—p. 227.
The Use of the Time Factor in Peritonitis. R. G. Doughty, Columbia, S. C.—p. 234.
Tumors of Larynx. F. E. LeJeune, New Orleans.—p. 243.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

1: 1033-1090 (May 23) 1936

Hormones and Pregnancy. J. M. Robson.—p. 1033.
A Center, or Centers, in Hypothalamus Controlling Menstruation, Ovulation, Pregnancy and Parturition. G. W. Theobald.—p. 1038.
*New Arsenical for Treatment of Syphilis and Trypanosomiasis. W. Yorke and F. Murgatroyd, in collaboration with F. Glyn-Hughes, H. M. O. Lester and A. O. F. Ross.—p. 1042.
Estimation of Percentage of Ethyl Alcohol in the Blood. H. K. V. Soltau.—p. 1048.
Traumatic Heterophoria. H. de Villiers.—p. 1050.

New Arsenical in Treatment of Syphilis and Trypanosomiasis.—As a result of examining the trypanocidal activity of a large number of arsenical products, Yorke and Murgatroyd selected sodium succinanilomethylamide-*p*-arsonate for detailed therapeutic trial. In experiments on laboratory animals this compound compared favorably with tryparsamide in that it was found to be rather less toxic and of somewhat greater trypanocidal activity than the latter drug. In man it was well tolerated in weekly amounts of from 2 to 4 Gm. The usual course consisted of the administration of this amount weekly until a total quantity of from 30 to 36 Gm. had been given. A number of patients had several such courses, the total quantity ranging from 66 to 141 Gm., while one patient had an uninterrupted course of 69 Gm., without showing any toxic signs. Apart from occasional nausea and vomiting, the only toxic signs observed were mild arsenical dermatitis in two patients and temporary jaundice in three advanced cases of neurosyphilis after prolonged courses of the drug. Visual disturbances have not been encountered. The drug exhibited the stimulating action associated with tryparsamide and other pentavalent aromatic arsenicals. In contrast with tryparsamide, the new drug exerts a definite action in primary, secondary and tertiary syphilis. In primary syphilis it alone is inadequate since, although the lesion cleared up rapidly, secondary manifestations developed subsequently. When it was combined with bismuth, the effects on primary syphilis seemed to be more permanent, and so far none of the patients treated in this way have relapsed. It has a definite action on tertiary manifestations of syphilis: the lesions disappeared completely in twenty of twenty-five cases. In early neurosyphilis and in tabes it gave satisfactory results. Of eleven patients with Nigerian sleeping sickness treated by a single course, ten became clinically normal and the other was improved. Eight of these patients had pathologic spinal fluids at the time of treatment; in three of them the fluid had become normal after the single course of treatment, in two it had become considerably improved and in one pathologic changes had apparently increased, although clinically the patient had become quite normal; the other two patients, owing to their clinical improvement, did not complete the treatment. In addition, a twelfth advanced case, which had failed to react to full courses of tryparsamide and other drugs, improved remarkably after a course of the compound.

Clinical Science, London

2: 149-236 (May 4) 1936

*Circulatory Changes in Fingers in Some Diseases of Nervous System, with Especial Reference to Digital Atrophy of Peripheral Nerve Lesions. T. Lewis and G. W. Pickering.—p. 149.
*Effect of Introducing Blood from Patients with Essential Hypertension into Other Human Subjects. G. W. Pickering.—p. 185.
Relationship of Carotid Sinus Mechanism to Persistent High Blood Pressure in Man. G. W. Pickering, M. Kissin and P. Rothschild.—p. 193.
Effects of Adrenalin and of Cold on Blood Pressure in Human Hypertension. G. W. Pickering and M. Kissin.—p. 201.
Peripheral Resistance in Persistent Arterial Hypertension. G. W. Pickering.—p. 209.

Circulatory Changes in Diseases of Nervous System.—Lewis and Pickering state that disuse, whether resulting from lesions of the motor nerves, from fixation of the joints or tendons or from psychic disturbances, leads to a diminished circulation through the skin of the immobilized part. After loss of sympathetic supply, there is some regaining of tone by the vessels of the affected limb, but the skin remains in general warmer than the symmetrical normal skin. After combined loss of motor and sympathetic supply, as in cases of long standing anterior poliomyelitis subjected to sympathectomy, the affected limb is in general warmer than the unaffected. Section of a mixed peripheral nerve leads first to abnormal warmth but soon to persistent coldness of the denervated skin. The change from warm to cold skin seems to correspond in time with degeneration of the sensory fibers. The reduction in blood flow through the skin after section of a mixed nerve is due chiefly to loss of the posterior root fibers, partly to regaining of vascular tone after loss of sympathetic supply, and partly to muscular inactivity consequent on motor nerve loss. The possibility of organic vascular change in the digital vessels in long standing cases of peripheral nerve section is also considered. The nutritional changes in the skin, subcutaneous tissues and bones are described in a number of patients with lesions of the nervous and locomotor systems. These changes may all be explained by disuse, defects in blood flow and sensory loss; and it is unnecessary to assume in explanation any "trophic" influence of the nervous system on these structures.

Transfusing Blood from Hypertensive Patients to Anemic Subjects.—Pickering declares that from 400 to 500 cc. of blood from five normal donors introduced into five anemic recipients in from six to twenty-six minutes produced rises of systolic pressure varying from 0 to 16 mm. of mercury and of diastolic pressure varying from 6 to 15 mm. of mercury. So small a rise in arterial pressure suggests that the introduction of this large volume of fluid was accompanied by a corresponding increase in the capacity of the circulation. The blood content of the skin vessels increased during the transfusion and the color of the face and hands deepened much more than could be accounted for by increase in the hemoglobin content of the blood. The venous pressure appeared to be raised from 2 to 4 cm. by the transfusion. The results of seven transfusions, in which from 350 to 600 cc. of blood from donors with hypertension was introduced in from four to nine minutes into anemic recipients, show that the changes in systolic pressure varied from a fall of 4 mm. to a rise of 7 mm., and of diastolic pressure from 0 to a rise of 8 mm. of mercury. The changes in the color of the skin and in the neck veins were similar to those seen when blood from normal donors was used. In each of the recipients receiving blood from donors with hypertension, the blood pressure was again measured after two and twenty-four hours; these pressures were a little lower (from 5 to 15 mm. of mercury systolic) than immediately before the transfusion, a difference probably attributable to excitement associated with this procedure. These results suggest that the blood of patients with essential hypertension is similar to normal blood in its content of pressor and depressor substances. The observations are opposed to the idea that in so-called essential hypertension the high blood pressure is due to excess of pressor or to deficit of depressor substance in the circulating blood. They could be made consistent with the view that the high blood pressure in such patients is due to a circulating pressor substance only by supposing that this substance is destroyed rapidly in vitro or in subjects without hypertension, or that the substance is inactive in relatively small dilutions. The results do not exclude the possibility that hypertension may be due to the intervention of a chemical agent which is not circulating but is fixed by the tissues. The therapeutic results of using donors with hypertension were quite satisfactory, and the procedure is one that may be commended as likely to benefit both the donor and the recipient.

East African Medical Journal, Nairobi

13: 33-64 (May) 1936

Primary Arterial Hypotension. A. J. Jex-Blake.—p. 34.
Red Cell Count and Cell Diameter of Kenya Natives. H. D. Tonking.—p. 43.
"Congenital" Relapsing Fever: Case. P. C. C. Garnham.—p. 50.

Glasgow Medical Journal

7: 201-256 (May) 1936

Blood Viscosity in Congestive Heart Failure. A. Markson.—p. 201.
The Opening of the Tennent Memorial Institute of Ophthalmology, Western Infirmary, Glasgow. A. M. Ramsay.—p. 213.
Ophthalmology and General Medicine. T. K. Monro.—p. 220.

Guy's Hospital Reports, London

86: 1-248 (Jan.-April) 1936

Guy's Hospital Reports, 1836-1936. H. Rolleston.—p. 1.
Thomas Wilkinson King, the Father of Endocrinology. W. Hale-White.—p. 4.
Remarks on Microscopic Preparations Made from Some of the Original Tissue Described by Thomas Hodgkin, 1832. H. Fox.—p. 11.
Acute Generalized Tuberculous Adenitis: Case. E. R. Boland.—p. 17.
Observations on Endocarditis. R. T. Grant.—p. 20.
*Spontaneous Fluctuations of Blood Pressure. A. Schott.—p. 69.
Studies in Bright's Disease: XII. Late Results of Acute Nephritis in Soldiers and Civilians. A. A. Osman.—p. 93.
Pustular Psoriasis of Extremities. H. W. Barber.—p. 108.
Observations on Gastritis. C. K. Simpson.—p. 120.
Incidence, Mortality and Treatment of Hemorrhage in Gastric Duodenal and Anastomotic Ulcer: I. Hospital Statistics. A. M. Babey.—p. 129.
Id.: II. Incidence, Mortality and Treatment of Hemorrhage. A. F. Hurst.—p. 135.
Letters on Orthopedics by W. H. Trethowan. Edited by C. Lambrinudi and T. T. Stamm.—p. 144.
Fate of Metallic Foreign Bodies Introduced into Tissues in Treatment of Fractures. D. W. C. Northfield.—p. 159.
*Serum Test for Diagnosis of Liver Disturbances. H. Ucko.—p. 166.
Leukemia and Deep X-Ray Therapy. W. L. Watt.—p. 175.
Ear and Occupation. W. M. Mollison.—p. 185.
Postoperative Chest Complications: Clinical Study. R. C. Brock.—p. 191.

Spontaneous Fluctuations of Blood Pressure.—Schott measured the systolic and diastolic blood pressure in the ward by the auscultatory method at intervals of from fifteen to twenty minutes during about one hour in sixty-four unselected cases admitted to Guy's Hospital for reasons other than cardiovascular disease. In twelve cases there was transient or permanent hyperpiesia, the systolic pressure being 160 mm. of mercury or more and/or the diastolic 100 mm. of mercury or more; the remaining fifty-two patients had normal blood pressure. Changes in the systolic pressure up to 10 mm. of mercury occurred in twenty-one cases and in the diastolic pressure in thirty-eight cases. Changes in the diastolic pressure of not more than 5 mm. were observed in only seventeen cases. In the remaining forty-three cases the systolic and diastolic changes ranged from 15 to 45 mm. systolic and from 15 to 30 mm. diastolic. Maximal differences existed in the systolic and diastolic pressure in each arm. The author is unable to offer any explanation for this difference; whether the blood pressure determinations were done first on the right or on the left arm was of no influence. The incidence of marked fluctuations of both systolic and diastolic pressure was comparatively high in the twelve cases of hyperpiesis. Almost every conceivable type of curve representing the changes of blood pressure during the time of observation has been found to occur in the present series of cases. The main causes which are known to produce periodic changes in blood pressure experimentally and clinically are respiratory changes, periodic changes independent of respiration and having a slower frequency and diurnal changes, and the causes of nonperiodic changes are posture, ingestion of food, changes in temperature, physical exercise and emotional factors. The most important cause for changes in pressure was observed to be the emotional factor. The great variations of both systolic and diastolic pressure emphasize the often cited but neglected fact that an isolated reading of blood pressure has only a limited value. The study of the fluctuations of blood pressure as observed under the conditions prevailing in a hospital ward seems to be a functional test of the response of blood pressure to the comparatively weak stimuli caused by unrest in such a hospital ward and by the emotional upset caused by the investigation under those conditions. Abnormally high fluctuations of blood pressure may then be interpreted in an analogous way; viz., that patients exhibiting such abnormally high fluctuations, particularly if they are young and if the fluctuations affect both systolic and diastolic pressure, should be looked on as possibly being in the prehypertensive state and should therefore be treated accordingly and watched over a period of years. Abnormally high fluctuations without any reading showing a figure actually above normal would be suggestive of the first stage of such a prehypertensive condition.

Serum Test for Diagnosis of Liver Disturbances.—Ucko modified the Takata reaction for the diagnosis of disorders of the liver in the following manner: Into five clean test tubes, each of a diameter of 11 mm., containing 0.2 cc. of serum, are measured 0.1, 0.15, 0.2, 0.25 and 0.3 cc. of a 0.36 per cent solution of anhydrous sodium carbonate. After shaking, the same quantities of a 0.5 per cent solution of mercury bichloride are added. The tubes are shaken again and allowed to settle. Four different types of reaction can be observed by daylight: 1 immediately after addition of the reagents, 2, 3 and 4 after one and a half hours. Reaction 1 (++++): a thick precipitation forms in all the tubes immediately after the addition of the reagents. Reaction 2 (++): all the tubes show a uniform turbidity. Reaction 3 (+): in the first three tubes a uniform turbidity is present; the remaining two tubes are translucent. Reaction 4: three or more tubes are translucent. Of 132 patients tested by both methods, the results of the two reactions differed in twenty-six cases: 1. Of four patients with a positive modified reaction and a negative Takata reaction, three were suffering from liver disease which was confirmed in two of them at postmortem examination. In the fourth patient with a general carcinomatosis, secondary deposits in the liver were highly probable. 2. Of twenty-two cases with a negative modified reaction and a positive Takata reaction, the possibility of a liver involvement has to be admitted in three, while nineteen cases were apparently free from any liver disturbance and no probability of such a complication arose from the clinical picture. Only seven of these nineteen patients had a really positive Takata reaction, while the remaining twelve showed only flocculation in two tubes of the range. It seems therefore that the results of the Takata reaction would be more conclusive if the so-called weakly positive reaction (+) was considered negative. The comparison of the two reactions shows that the modified reaction is capable of indicating liver disturbance with more certainty than the original Takata reaction. In addition to the technical advantages, the gradation of the results of the modified reaction offers the possibility of distinguishing between different forms of liver disease.

Indian Journal of Medical Research, Calcutta

23: 837-1036 (April) 1936

Adsorption of Antigens by Antibodies or Vice Versa: Part II. B. N. Ghosh.—p. 837.
Proteus Group: Observations on Twenty-Five Strains Maintained at the King Institute, Madras. S. R. Pandit.—p. 847.
Cultivation of Vaccinia Virus on Chorio-Allantoic Membrane of the Chick Embryo. R. Sanjiva Rao, C. G. Pandit and H. E. Shortt.—p. 857.
Cultivation of Viruses of Sandfly Fever and Dengue Fever on Chorio-Allantoic Membrane of the Chick Embryo. H. E. Shortt, R. Sanjiva Rao and C. S. Swaminath.—p. 865.
Filariasis in Patnagarh (Orissa Feudatory State). S. Sundar Rao.—p. 871.
Viability of "Infective" Forms of Larvae of Wuchereria Bancrofti When Freed from Mosquito Host. K. P. Menon and P. V. Seetharama Iyer.—p. 881.
Life History and Morphology of Babesia Canis in Dog-Tick Rhipicephalus Sanguineus: Parts I and II. H. E. Shortt.—p. 885.
Studies on Typhus in Simla Hills: Part IV. Rôle of Rat Flea in Transmission of Typhus. G. Covell and D. R. Mehta.—p. 921.
Growth of Embryonic Nervous Tissue in Plasma Taken from Vitamin A Deficient Fowls and Rats. W. R. Aykroyd and G. Sankaran.—p. 929.
Carotene Content of Some Indian Vegetable Foodstuffs: Preliminary Note on Its Variation Due to Storage: Parts I and II. N. K. De.—p. 937.
Comparative Study of Some Properties of Carotene and Lycopene. N. K. De.—p. 949.
Action of Lugol's Iodine Solution on Thyroxinized Heart. R. K. Pal.—p. 957.
Rate of Absorption of Glucose from Gastro-Intestinal Tract of the Cat and Influence of Insulin on Absorption Coefficient. H. Chaudhuri and B. S. Kahali.—p. 963.
Hematologic Studies in Indians: Part V. Red Blood Cell Measurements. L. E. Napier and C. R. Das Gupta.—p. 973.
*Use of Tapioca in Immunization with Snake Venoms. S. M. K. Mallick.—p. 993.
Studies on Indian Snake Venoms: Part I. Daboia Venom: Its Chemical Composition, Protein Fractions and Their Physiologic Action. S. N. Ganguly and M. T. Malkana.—p. 997.
*Cirrhosis of Liver Following Chronic Intoxication with Carbon Tetrachloride: Experimental Study. M. V. Radhakrishna Rao.—p. 1007.
Study of Epiphyseal Union for Determining Age of South Indians: Study of One Hundred Cases, Chiefly from the Madras Schools and Colleges, Ages Ranging from 10 to 23. M. J. S. Pillai.—p. 1015.

Use of Tapioca in Immunization with Snake Venoms.—Mallick studied the effect of the addition of a sterile suspension of tapioca and of aluminum hydroxide to the venom solutions employed in immunizing animals for the production of

antivenene. He found that when tapioca suspensions were added it was possible to bring horses to standard titer against both cobra and daboia venoms with greatly reduced dosage of the venoms, the quantities employed being one third of that found necessary formerly. Comparative trials in goats showed that the addition of tapioca was of special value in immunization with cobra venom and that this addition was more satisfactory than the use of aluminum hydroxide. The extensive suppurative reactions with abscess formation, which occurred when tapioca was not employed and with the larger doses formerly used to reach titer, were not observed when tapioca was added or were of much less degree.

Cirrhosis of Liver Following Carbon Tetrachloride Intoxication. — Radhakrishna Rao found that the repeated administration of small doses (from 0.1 to 0.2 cc. once or twice a week) of carbon tetrachloride subcutaneously to albino rats produced toxic cirrhosis. The fibrous tissue was mainly distributed around the hepatic venous tree, which showed sclerotic changes in its larger divisions; its genesis in the cirrhosis thereby induced was traced to a disorganization, collapse, condensation and sclerosis of the perisinusoidal reticulum around the hepatic terminals, consequent on a necrosis of the parenchyma in the same area.

Journal of Neurology and Psychopathology, London

16: 289-384 (April) 1936

Multiple Metastatic Tumors in the Brain Arising from Primary Bronchial Carcinoma. W. E. C. Dickson and C. Worster-Drought.—p. 289.

Heat Regulation in Dementia Praecox. Reactions of Patients with Dementia Praecox to Cold. I. Finkelman and W. Mary Stephens.—p. 321.

État Marbré. A. Meyer and L. C. Cook.—p. 341.

Some Observations on Masked Epilepsy and Simulation of Traumatic Epilepsy by Cerebral Tumor, with Especial Reference to Head Injuries Without Fracture. L. R. Yealland.—p. 353.

Lancet, London

1: 1161-1222 (May 23) 1936

Biochemical Lesion in Vitamin B_1 Deficiency: Application of Modern Biochemical Analysis in Its Diagnosis. R. A. Peters.—p. 1161.

*Anemia in Pregnancy. J. A. Boycott.—p. 1165.

Acute Suppurative Thyroiditis. R. Coope and L. Findlay.—p. 1172.

The Intravenous Route: New Method and Apparatus. C. G. K. Thompson.—p. 1173.

Prognosis of Resection in Carcinoma of the Stomach. W. Anschütz.—p. 1175.

Anemia in Pregnancy.—Boycott examined 222 unselected patients attending the antepartum clinic at University College Hospital. One hundred and seventy-two always had hemoglobin above 80 per cent, fifty hemoglobin below 80 per cent on at least one occasion and twenty-five below 70 per cent. Twenty-six cases in which the hemoglobin was below 80 per cent were examined in detail; their histories and present states gave ground for supposing that the low level of hemoglobin was due to pregnancy alone. It was found that they were equally divided into those with normal and those with subnormal color indexes. These two classes could also be distinguished on clinical and hematologic grounds. There is evidence to show that there is an inconsistent increase in the plasma volume in pregnancy causing a dilution of the red cells, and it has been suggested that the existence of the group with low hemoglobin figures and normal color indexes is explicable on this basis. On the grounds of hematologic resemblances and satisfactory response to iron treatment the group with low color indexes has been assigned to the class of anemia due to iron deficiency. The two groups are not mutually exclusive. Thirteen of these have been ascribed to iron deficiency due to the demands of the fetus in combination with either dietary insufficiency or defective utilization of iron. The remainder occurred in patients who had some complicating disease; the majority of these were of the hypochromic type. Although the series is too small to establish the preeminence of any factors as a cause of anemia in pregnancy, the evidence goes to show that diseases which cause anemia in the normal subject also predispose to anemia in pregnancy. Although the data are suggestive, it is not proved that social status, age or parity affects the incidence of anemia.

Medical Journal of Australia, Sydney

1: 631-664 (May 9) 1936

The Problem of Calcification. F. S. Hansman.—p. 631.

Herpes, Cramps, Fidgets and Other Disordered Sensations. R. S. Skirving.—p. 643.

Growth Curve of Australian Infants During Second Year of Age. F. W. Clements.—p. 647.

Reaction of Dilator Muscle of the Pupil to Light and Its Bearing on Argyll Robertson Sign. K. O'Day.—p. 648.

Carriage of Serum for the Wassermann Test. C. J. Hackett.—p. 650.

Chinese Medical Journal, Peiping

50: 297-650 (April) 1936

*Use of Dry Form of Placental Extract in Modification of Measles. F. T. Chu and C. Y. Chou.—p. 297.

Cancrum Oris: Clinical Study of One Hundred Cases, with Especial Reference to Prognosis. F. T. Chu and C. Fan.—p. 303.

Infantile Beriberi in Shanghai. C. L. Kao.—p. 324.

Tetany in Nephritis: Report of Case with Postmortem Findings. C. Fan and K. Y. Ch'in.—p. 341.

*Congenital Bone Syphilis: Roentgenologic Diagnosis in Infants Under One Year of Age. T. S. Jung.—p. 352.

Stovarsol Treatment of Congenital Syphilis in Chinese Children. P. L. Fan.—p. 364.

Splenic Enlargement in Infants and Children: Statistical Study of 1,028 Cases. F. T. Chu and Sarah Deitrick.—p. 382.

50: 651-760 (May) 1936

Study of Blood in Cholera: Note on Urine Analysis. V. T. Loh and T. Y. Tai.—p. 651.

Placental Extract in Modification of Measles. — To shorten the time for the fractionation of globulins and to get a dry form of extract that may be better preserved, Chu and Chou used methyl alcohol as a precipitating agent, following the method of Liu and Wu. The redissolved extract is immunologically as potent as the preparation made from ammonium sulfate precipitation. The dry extract is convenient for pooling and may be stored without rapid deterioration. When the dry product is redissolved and administered intramuscularly to susceptible family contacts early in the incubation period, either modification of measles or its complete prevention may be the result. If the nonimmune children who are intimately exposed to measles at home are given the extract on the fourth or fifth day after exposure, a dose of from 0.02 to 0.025 Gm. of the protein per kilogram of body weight is adequate for the successful modification of measles.

Congenital Bone Syphilis.—Jung gives an analysis of the roentgenologic changes in the long bones of sixty-two infants less than 1 year of age, including six stillborn premature fetuses. A zone of decreased density just proximal to a zone of provisional calcification (osteochondritis) was found in only six cases. Cases were placed under this category if the rarefaction was sharply outlined and if the bony trabeculations inside such an area could be seen in normal orderly arrangement, even though decreased in number. When the zone was irregular in outline and actual destruction of the bone could be seen, it was included as an osteomyelitic process. A more advanced stage of osteochondritis, a zigzag or saw-tooth-like type of lesion in the region of the metaphysis, was found in ten infants. In four of the ten cases this form of osteochondritis was the only positive sign present. When the lesion is further advanced with evident bony destruction, it should be considered an osteomyelitic change. As the change into granulation tissue progresses, epiphyseal separation may occur. The so-called epiphyseal separation was present in eleven cases, the distal ends of the radii and ulnas being the most frequent location. Osteomyelitis is the most common lesion in advanced osteochondritis. In the fifty-six syphilitic infants born alive, osteomyelitis was present in forty-four. Thirty-one showed symmetrical distribution of the lesion. Typical symmetrically punched-out destruction at the upper inner aspects of the tibias was found in fifteen instances. In three of them these were the only diagnostic syphilitic changes. Fairly extensive osteomyelitic changes involving the shaft of the long bones were present in five cases. There were eleven cases in which osteochondritis was present without any definite evidence of periostitis. These included all the six stillborn premature fetuses, and the other five cases were all in the first month of life. Periostitis without definite evidence of osteochondritis was seen

in four instances. Of the twenty-seven cases of periosteal thickening, eleven showed two or more layers of periosteal shadows with a thin zone of radiolucency between, exhibiting a tendency toward ossifying periostitis. The supportive type of periostitis was usually seen accompanying marked osteochondritis. Periostitis of this type was seen in twenty of twenty-seven cases showing osteomyelitic changes.

Archives de Médecine des Enfants, Paris

39: 329-392 (June) 1936. Partial Index

Lipoid Nephrosis and Azotemia. P. Gautier.—p. 329.
*Clinical Diagnosis of Strangulated Diaphragmatic Hernia. L. Garot. p. 337.
*So-Called Hilus Pneumonias of Children. A. Carrau and H. C. Bazzano. —p. 354.

Diagnosis of Strangulated Diaphragmatic Hernia.—In discussing the diagnosis of strangulated diaphragmatic hernia, Garot says that the epigastric pain is intermittent and at times almost unbearable. Vomiting may be the first symptom of the occlusion or may not appear for several hours. Dyspnea is an early symptom and may be so marked as to be accompanied by the use of the accessory respiratory muscles. The intensity of the cyanosis varies. The facies is changed after the first few hours and recalls the so-called abdominal facies. The subject is in shock but has no fever. Thoracic symptoms are dominant. Dilatation of the left hemothorax with reduction or even repression of the respiratory expansion can be found by inspection and palpation. The heart is pushed toward the right. Differential diagnosis between intestinal invagination and a strangulated diaphragmatic hernia is accomplished by means of the clinical signs and symptoms and especially by x-ray examination. Strangulated diaphragmatic hernia of the stomach or the intestine constitutes an accident which carries a severe prognosis. Death may supervene after a time, varying from a few hours to two or three days. The only possible treatment is surgical, and hence the early diagnosis of this relatively rare disorder is most important.

Hilus Pneumonias of Children.—Carrau and Bazzano believe that the pneumonias which are called hilus pneumonias because of the x-ray observations are in reality in the cases observed by them pseudohilar. These pneumonias are localized in the right or left lower lobes or in the middle lobe, the latter constituting a group around the hilus during their entire evolution, while the two former localizations are hilar at the beginning but extend toward the pulmonary bases as they develop. These facts explain why this variety of pneumonia ascends. X-ray examinations, both oblique and in profile, are necessary in order to verify the exact anatomic situation of the process in relation to the hilus. Initial pneumonic bronchial adenopathy is not constantly observed. The pneumonias can begin in the pulmonary parenchyma around the hilus, but in the majority of the authors' cases the initial clinical roentgenologic point was always in the dorsal portion in the middle lobe, always near the inner lobe fissures. Consequently in the upper lobes it is below and dorsal, in the lower lobes it is above and dorsal, and in the middle lobe it is posterior and near the fissure.

Presse Médicale, Paris

44: 913-936 (June 6) 1936

*Skin Reactions to Tuberculin in Children Aged from 6 to 10 Years. P. Nobécourt and S. B. Briskas.—p. 913.
Definite Cure of Urticaria of Anaphylactic Type Following Appendectomy. R. Leriche.—p. 916.
Colonic Intolerances. R.-A. Gutmann, A. Tzanck and J. Arnous. —p. 917.
Remarks on Classification of War Gases. J. Dadlez and W. Koskowski. —p. 920.

Tuberculin Skin Reactions in Children.—Between 1921 and 1935, inclusive, Nobécourt and Briskas made Pirquet tests and when necessary intradermal tests on 1,989 children aged between 6 and 10 years Of these, 58 per cent were boys and 42 per cent were girls. The percentage of positive reactions was 10.7 for the combined groups, and 12.7 for the boys and 8 for the girls, separately. The interpretation of these results involved considerable difficulty. Positive cutaneous reactions are obtained in children having active tuberculosis or occult tuberculosis or being carriers of discrete lesions which are not in any way active. When the positive tests were analyzed in greater detail as to sex distribution and frequency over the fifteen year period, the conclusion was advanced that the number of children of this age group contaminated by tubercle bacilli had diminished since 1929. The number of actively tuberculous had not changed materially. In the seventh and eighth years the proportion of active tuberculosis was lower in boys than in girls. In the ninth year the proportion was raised in the boys, while it was lowered in the girls. In the tenth year the proportion diminished in both boys and girls, although remaining slightly higher in the former. It was notable that between the sixth and the tenth year there was an increase in the percentage of positive cutaneous tuberculosis reactions, which contrasted with the relative fixity of the percentage of active tuberculosis.

Schweizerische medizinische Wochenschrift, Basel

66: 585-608 (June 20) 1936. Partial Index

Nervous Diseases in Human Subjects and Animals. E. Frauchiger. —p. 585.
Chemotherapy in Treatment of Malaria. S. P. James.—p. 587.
Idiopathic Stenosing Periduodenitis. J. R. Dreyfus.—p. 588.
*Protection Against Yperite (Dichlordiethylsulfide, or Mustard Gas)—Prophylactic Treatment Against Yperite. A. Schrafl.—p. 591.

Protection Against Yperite (Mustard Gas).—Schrafl reports observations on the efficacy of various therapeutic and prophylactic measures that are employed against yperite (mustard gas). He was able to make these tests on a man who, to satisfy his curiosity, had burned himself with yperite and who requested that the protective measures be likewise tested on him. Twelve different patch tests were made (ten on the back and two on the upper arm). Some of the tests corroborated observations made by other investigators, for instance, that the impairment is the more severe the earlier the first sign, reddishness, appears; that is, the shorter the period of latency. The tissue lesions reach their maximum after forty-eight hours and after that they commence to subside. The author differentiates three stages of impairment by yperite: (1) reddishness and swelling, (2) blister formation and (3) tissue destruction. He describes and then discusses the appearance of the various patch tests after forty-eight hours. He was able to corroborate Muntsch's observation; namely, that washing with a suspension of chlorinated lime (1:10) and rinsing with water is most effective when done during the first ten minutes after exposure to mustard gas. Bandaging with a 5 per cent chlorine petrolatum (0.5:10) was likewise found helpful for prophylactic treatment. However, he observed also that the area which was washed with chlorinated lime solution fourteen minutes after exposure was considerably less impaired than the area that remained untreated. The aforementioned chlorine petrolatum did not prove effective as a protective ointment against the gas but only for prophylactic treatment; that is, after exposure to the mustard gas.

Annali Italiani di Chirurgia, Naples

15: 1-174 (Jan.-Feb.) 1936

Treatment of Perforations of Gastroduodenal Ulcers in Free Peritoneum. G. Conti.—p. 1.
*Action of Vitamins on Healing of Wounds. M. Proto.—p. 31.
Chronic Gastritis: Clinical and Histologic Study. G. Perazzo.—p. 43.
Benign Tumor of Epididymis: Case. A. Scalfi.—p. 81.
Cholecystographic Aspects of Abdominal Diseases Complicating Syndrome of Right Abdominal Quadrant. Q. Vischia.—p. 125.

Action of Vitamins on Healing of Wounds.—Proto made experiments to ascertain the action of vitamins A, C and D on the healing of wounds in rabbits. The animals, both those treated by the vitamins and the controls, were normally fed and kept in the same condition. The animals treated by vitamins were placed in the following groups: (1) those treated by administration of the vitamins by the mouth, (2) those treated by application of the vitamins on the wound and (3) those treated simultaneously by oral administration and local application of the vitamins. The animals in each of the groups were placed in the A, C and D groups, according to the vitamins that were administered to them. The process of healing is not modified at all by vitamin C, whether administered by mouth or locally applied, but it is slightly modified by vitamins A and D given by mouth and greatly and favorably modified by local application of these vitamins to the wounds, especially vitamin A. The time of healing is greatly lessened and the condition of the wounds is much better than in the controls.

Annali di Ostetricia e Ginecologia, Milan

58: 727-880 (June 30) 1936

*Placental Cavities or Foci of Dissociation? F. Spirito.—p. 727.
*Multiple Metastases of Chorionepithelioma. A. Vignali.—p. 769.
Gonorrhea and Extra-Uterine Pregnancy. D. Mancini.—p. 811.
"Partus Nullus": Etiopathogenesis and Report of Cases. E. Giudici. p. 829.

Cavities in the Placenta.—Spirito states that cavities are found in the normal human placenta, some of them are true cysts of decidual or trophoblastic origin or come from colliquation of infarcts. Those of a decidual origin are located between or within the cotyledons. Placentary cavities originate in necrosis and colliquation of the villi, are located within the cotyledons, and do not have the shiny white zone of delimitation that cysts and pathologic cavities may have. Histologically, the walls of placental cavities consist of more or less perfectly identifiable villi, while those of other placental formations consist of decidual or trophoblastic cells or by other cells similar to those of the villi but greatly changed like those found in infarcts. Placental cavities have no relation with fetal circulation. With the aim of differentiating the several formations of human normal placenta, it is advisable to give the name of placental cavities to those of villous origin (which were described the first time by Poso and Clemente), the name of cysts (subchorial and intraplacental, according to their location) to those of decidual, trophoblastic and infarct origin, and the name of cavitary lesions or hemorrhagic foci to the pathologic cavities.

Multiple Metastases from Chorionepithelioma.—Vignali says that the presence of a greatly enlarged uterus of softened consistency, with an open cervix and expelling dark blood and remnants of tissues, similar to placenta, is an indication for immediate complete hysterectomy, with removal of the adnexa, which according to the literature controls further development of metastases and modifies metastases already present. His patient, aged 20, entered the hospital three months after a normal labor and puerperium with a syndrome of cerebral hemorrhage, with left hemiplegia and hemianesthesia and also with slight fever. The condition remained stationary for three weeks without responding to symptomatic treatment, after which the fever increased and a grave syndrome of albuminuria, azotemia and blood in the feces, urine and vomiting, in addition to toxic symptoms, made its appearance. The patient began to discharge dark blood through the genitals. Genital examination showed a large tumor in the uterus. A clinical diagnosis was not made. The syndrome was caused by a chorionepithelioma of rapid evolution of the uterus, with metastases to the brain, kidney and intestine. The uterus and adnexa were entirely involved in the tumoral process. The ovaries were polycystic. The metastases to the brain, kidney and intestine were extensive, with foci of hemorrhage with the blood in a process of disintegration. An extensive focus of hemorrhagic infiltration was located at the internal capsule, under the rolandic fissure. The author states that in his case the evolution of the disease was so rapid that hysterectomy at the time of admission of the patient to the hospital, when the cerebral but not the renal and intestinal metastases had taken place, probably would have resulted in no benefit to the patient.

Giornale di Clinica Medica, Parma

17: 769-840 (June 30) 1936

Hyperglobulia from Bleeding. A. Marrassini.—p. 769.
*Vertebral Lesions in Undulant Fever. F. Pratesi.—p. 789.
Action of Sodium Dithionate on Glutathione in Certain Organs of Guinea-Pigs. C. Gualazzini.—p. 801.
Changes of Leukocytes from Mechanical Stimulation of Appendix in Chronic Secondary Appendicitis with Symptomatic Febricula. C. Sestini.—p. 817.

Vertebral Lesions in Undulant Fever.—Pratesi says that the clinical diagnosis of spondylitis melitensis may be considered impossible. A positive diagnosis can be made only by the characteristics of the vertebral lesions in the roentgenogram, which are characterized by moderate destruction of the bone and intense formation and reconstruction of the bone. Early in the development of spondylitis melitensis the vertebral alterations are not clear in the roentgenogram. Nevertheless, the diagnosis is made by the existence of serologically proved undulant fever in the history of the patient, the presence of lumbar or lumbodorsal spondylitis of a scoliotic or kyphoscoliotic type and, in the roentgenogram, of the moderate bone destruction and excessive bone formation and reconstruction of the involved vertebra with absence of symptoms and roentgen signs of ossifluent abscess. The author reports a case of spondylitis melitensis in a patient, aged 46, in whom the diagnosis of Pott's disease was entirely excluded.

Archivos de Medicina Cirugía y Espec., Madrid

39: 381-420 (June 15) 1936

Treatment of Laryngeal Tuberculosis by Ultraviolet Irradiation (Cemach's Lamp): Is Modification of Technic Advisable? J. Jimenez Cervantes-Pinelo.—p. 381.
*Parathyroid Function in Relation to Chemism of Muscles. J. Morros Sardá, Celsa Pérez Moreiras and A. Fernandez Cruz.—p. 383.
Left Diaphragmatic Eventration: Cases. F. Pons Ibáñez and P. Moragues González.—p. 387.

Parathyroid Function.—Morros Sardá and his collaborators studied the modifications of the organic and inorganic phosphorus and carbohydrates of muscles of rabbits injected with parathyroid extract, creatinine or the two substances simultaneously. The authors conclude that the injection of parathyroid extract causes an increase of the total phosphorus in the muscle with a predominance of the inorganic over the organic fraction. Creatinine, when intravenously injected, brings about a slight increase of the phosphorus compounds of the muscle. The simultaneous injection of parathyroid extract and creatinine is followed by marked accumulation of phosphorus in the muscle, with predominance of phosphagen, and also by an accumulation of carbohydrates in the muscle which is at its peak one hour and a half after the injection is made. Parathyroid functions play a part in the metabolism of creatinine by favoring the esterification of the latter into phosphagen and its utilization in this form by the muscles. The antitoxic functions that the parathyroids are supposed to have depend on the intervention of the parathyroid hormone in the formation of phosphagen. Therefore the lack of esterification of creatinine would result in the presence of free creatinine and guanidine, the accumulation of which would result in the development of toxic symptoms. The absence of the parathyroid hormone would result in incomplete or difficult formation of the creatine-phosphoric acid complex, the accumulation of creatine derivatives and the development of autotoxic symptoms.

Prensa Medica Argentina, Buenos Aires

23: 1411-1462 (June 10) 1936

*Dysgenesias of Respiratory Tract. J. B. Morelli.—p. 1411.
Skeletal Traction with Steinmann's Extension Nail: Results. F. Basch. —p. 1430.
Action of Genital-Stimulating Hormones and of Folliculin on Basal Metabolism and on Specific Dynamic Power of Albumin. M. Schteingart and Ida Ch. De. Uryson.—p. 1440.
Atypical Mibelli Angiokeratoma: Case. M. F. Blanco.—p. 1442.
Congenital Syphilis. J. L. Carrera.—p. 1445.
Delmas' Method for Onset of Labor. J. R. Valenzuela.—p. 1447.

Dysgenesia of Respiratory Tract.—According to Morelli there is a form of congenital subpleural giant emphysema that is one of several types of complicated syndromes known as dysgenesia of the respiratory tract (impaired intra-uterine development of one or several segments of the respiratory tract). Emphysema in these cases is in direct communication with the bronchial tree and with the pulmonary alveoli, at the seat of implantation of the bleb. Iodized oil intrabronchially injected fails in passing to the sac, but if a weak solution of methylene blue is injected into the sac by the transthoracic route, the dye passes immediately to the bronchi. The diagnosis is made by roentgenography of the lung, which shows an irregular line of division between the lung and the emphysema. The prognosis depends on the significance of coexisting malformations. In the three cases of the author, congenital emphysema was complicated by malformations of the pulmonary artery, erythremia and paradoxical cyanosis. The anatomicopathologic study of the respiratory tract performed in two of the cases proved that the main malformation was located at the pulmonary artery and consisted in defective development of the elastic fibers of the artery, which were few, small and thin.

Archiv für klinische Chirurgie, Berlin

185: 189-358 (June 3) 1936. Partial Index

Attempt at Differentiation of Disease Processes, Particularly Malignant Neoplasms, by Ultramicroscopic Examination of Blood Serum. W. Fischer.—p. 189.

*Observations on Cholesterosis of Gallbladder. A. Troell.—p. 211.

*Late Results of Surgical Therapy of Gastroduodenal Ulceration and Gastric Cancer. E. Harms.—p. 241.

Clinical and Experimental Study of Gastropathy of Appendicular Origin. M. Mashiko.—p. 284.

Pathologic Alterations of Vessels Following Vasography with Thorium Dioxide Sol. G. A. Sedgenidse.—p. 299.

Distribution of Tension in Neck of Femur. G. Küntscher.—p. 308.

Cholesterosis of Gallbladder.—In a study of 600 cholecystectomies performed during the period between 1925 and 1934, Troell found three cases of so-called lime bile and twenty-three of cholesterosis or strawberry gallbladder. Besides the stones, the gallbladders in the first group contained an amorphous, putty-like substance the color of which was like that of the stones. This "lime bile" was possibly the forerunner of the stones. Of the twenty-three cases of the cholesterosis group, nineteen presented stones. In seven of these there was present a solitary stone made up entirely, or almost entirely, of cholesterol. In two cases large cholesterol stones were associated with smaller stones. In five there were found small mulberry stones the chief component of which was cholesterol. On gross inspection these gallbladders presented a fine white or yellowish white structural network above the mucosa. It gave the impression in one of the cases of incrusted cholesterol. In two cases the reticulated mucosa showed prominent, yellowish white nodes in its entire extent. In one case formations resembling pedunculated papillomas were observed. Microscopic examination revealed chronic inflammation in eighteen and acute inflammation in three of the cases. Deposition of cholesterol was the characteristic feature. In the subepithelial connective tissue layer there were clusters of large, clear round or polygonal phagocytic cells with a small nucleus, containing fat and giving the cholesterol reaction. The source of cholesterol in strawberry gallbladder was believed by some observers to be the result of secretion by the mucous membrane, while others, notably Aschoff, held that its source was the gallbladder bile from which it was absorbed by the mucosa. By analogy with the stones of "lime bile," one is tempted to conclude that cholesterosis represents the first stage in the formation of cholesterol stones. Further observations will be necessary before this hypothesis can be accepted.

Late Results of Treatment of Gastroduodenal Ulcer and Gastric Cancer.—Harms presents a follow-up study of late results of surgical therapy in 846 cases of benign lesions of the stomach and duodenum and of 432 operations performed for malignant disease of the stomach. The operations were carried out during the period between 1920 and 1927. Radical operations for gastroduodenal ulcer gave entirely satisfactory results in 80 per cent of the cases, while the indirect methods (palliative operations) gave good results in only 50 per cent. No difference was noted in the late results of the first Billroth and the second Billroth operations. Failure after gastroenterostomy and pyloric exclusion were noted with the greatest frequency in the younger patients. It was only after the fifth decade that better results were noted. Even the penetrating duodenal ulcers not amenable to resection still offered a relatively good prognosis in persons past 50. Resection of the pylorus and antrum and segmental transverse resection are likewise followed by better results in the older patients. The first Billroth operation appeared to be best suited for the younger patients. The longer the lapse of time since the operation, the better were the results with the first Billroth operation, and the worse with the indirect procedures. Better late results could be expected when the resection of the pylorus and antrum was undertaken for an extensive ulcerative lesion than when it was performed for a superficial ulcer. Peptic jejunal ulcer was the principal cause of failure after gastroenterostomies and pyloric exclusions (13.4 and 15 per cent, respectively). The transverse resection gave an incidence of 7.8 per cent of recurring ulcer and 6.1 per cent of disturbances of motility. Following the second Billroth method of resection the incidence of peptic jejunal ulcer was 0.8 per cent and that of recurring ulcer 2.5 per cent. The failure to obtain good results after the first Billroth method of resection was because of recurring ulcer in 4.1 per cent and narrowing of the anastomosis in 3.4 per cent. Of the 432 cases admitted with the diagnosis of cancer of the stomach, 75 per cent were inoperable. The operative mortality was 32.9 per cent. Peritonitis was the most frequent cause of death. Most of the patients surviving the operation died within the first two years; 33⅓ per cent survived the five year period and 8.3 the ten year period. The best prognosis was offered by adenocarcinomas limited to the stomach with an average duration of not more than seven and a half months. Prognosis appeared to be somewhat better in the older patients.

Deutsche Zeitschrift für Chirurgie, Berlin

247: 1-144 (May 18) 1936. Partial Index

Surgical Significance of Streptotrichosis. G. Woytek.—p. 1.

Effect of Operative Trauma on Respiration, Capillary Gas Exchange and the Volume of Circulating Blood. E. Derra.—p. 82.

*Management of Appendiceal Inflammatory Tumor and of Abscess. W. F. Suermondt.—p. 96.

Aseptic Meningitis Following Operation for Cystic or Breaking-Down Blastomas. G. Merrem.—p. 105.

*So-Called Hemolytic Shock. G. Woytek.—p. 113.

Etiology, Diagnosis and Therapy of Acute Adrenal Insufficiency. M. Breitfellner and R. Herbst.—p. 123.

Appendiceal Inflammatory Tumor and Abscess.—In his indication for operative intervention in acute appendicitis, Suermondt is governed by the question of whether the inflammatory process manifests a tendency to encapsulation and not by the number of hours elapsed since the onset of the attack. A patient with an acute spreading peritonitis is submitted to an appendectomy regardless of the number of hours elapsed. The presence of diffuse peritonitis constitutes an even more stringent indication for operative intervention. On the other hand, a patient presenting himself with a sharply delimited inflammatory swelling in the appendiceal area even before forty-eight hours has elapsed is treated on a conservative plan. This consists of absolute rest in bed in the Fowler position, strict diet and application of an ice bag. No attempt is made to differentiate sharply between an infiltrate and an abscess. The infiltrate may undergo complete absorption, in which case the appendectomy is performed six weeks later. The inflammatory swelling, on the other hand, may continue to grow in size and to give rise to pain. The danger of perforation into the free peritoneal cavity is imminent if the abscess enlarges upward or mediad. Rise in temperature, onset of vomiting and muscle rigidity that did not exist before constitute, together with the type of enlargement already described, an indication for immediate operative intervention. The abscess is incised and drained. No attempt is made to find or to remove the appendix. When the approach to the abscess is through the free peritoneal cavity, the latter is carefully protected with iodoform gauze, which remains undisturbed and is removed some time after the operation. An abscess pointing downward is treated conservatively in the Fowler position. It forms, as a rule, an abscess of the pouch of Douglas. Such abscesses, according to the author, show no tendency to perforate into the free peritoneal cavity. They usually perforate spontaneously into the rectum, vagina or urinary bladder. The appendectomy was performed eight weeks later. To prove his contention, the author submits the statistics of the clinic in Leiden, where 2,853 patients having acute appendicitis, with or without an acute spreading peritonitis, were treated in the last twenty-five years by immediate operation, with a mortality rate of 2.7 per cent. There were 407 cases of inflammatory swelling in which treatment was given on a conservative plan with a mortality of 0.7 per cent. Of this group, 256 patients had recovered without any intervention. In 151 the abscess was incised. There were two fatalities in this group. Of the 405 surviving patients, 324 were submitted to a later appendectomy with one fatality (0.3 per cent). Eighty-one did not return for the appendectomy because they were free from symptoms.

Hemolytic Shock.—Woytek states that, despite some 350 blood transfusions performed annually in Sauerbruch's clinic, there were no fatalities and but few complications. Three cases of profound hemolytic shock were promptly saved by recourse to the method developed by E. P. Hesse and N. Filatov in 1932 and consisting of an immediate transfusion with com-

patible blood. From his observations the author concludes that the usual blood group determination with the aid of test serums does not guarantee against mishaps. Neither can absolute reliance be placed on the biologic test. The latter was negative in the three cases. Blood from a universal donor is more likely to cause reactions than that from the same group. Repeated transfusions utilizing the same donor are more likely to give rise to anaphylactic shock. The following rules were adopted in Sauerbruch's clinic: 1. Group determinations are made by testing at least twice and utilizing different serums. 2. The effect of the recipient's serum on the erythrocytes of the donor and the reverse is determined by direct cross-testing. 3. Universal donors are not used. 4. The biologic test is regarded valuable and is used as an adjunct but is not permitted to replace blood grouping. Experimental studies of E. P. Hesse and N. Filatov established that the symptoms of hemolytic shock are due to a direct toxic effect on the vessel walls of depressor substances released by the breaking down of the erythrocytes. This results in dilatation of the venous capillaries and in spasm of peripheral arterioles. The result is a fall in the blood pressure and impaired heart action because of insufficient return of venous blood to the right side of the heart. Cyanosis, dyspnea and particularly anuria are explained by the destruction of the erythrocytes with consequent lowering of the respiratory function and embolic closure of the finest pulmonary and renal vessels. The vascular phenomena of hemolytic shock resemble those of histamine shock. The red cells are the carriers of histamine. Hemolysis is the result of agglutination and breaking down of erythrocytes of the donor by the serum of the recipient. In cases in which control determinations of blood grouping were made, an error in determination was found to be the most frequent cause of hemolysis, as in one of the author's cases. In the remaining two, control tests revealed no error. The author speculates on the possibility of there existing a heretofore undiscovered incompatibility in the blood of two persons belonging to the same blood group. There may exist subgroups which are not recognized by the usual method of group testing. Failure to recognize early symptoms of hemolysis was responsible for the fatal result in most of the reported cases. The most characteristic and suggestive subjective symptom is the excruciating backache, resembling in its severity that of renal colic. According to Hesse and Filatov, it is the result of a spasm of the renal arteries. The cases reported by the author presented symptoms of severe hemolytic shock. Reinfusion with compatible blood accomplished in all three a prompt and lasting recovery. The author therefore concludes that the method proposed by Hesse and Filatov offers a prompt and efficient therapy of hemolytic shock.

Klinische Wochenschrift, Berlin

15: 769-808 (May 30) 1936. Partial Index

Requirements and Technic of Treatment of Pneumonia. J. G. M. Bullowa.—p. 769.
Experimental Studies on Effects of Analeptics in Suffocation. L. Lendle and F. H. Lü.—p. 775.
Investigations on Behavior of Peripheral Circulation in Healthy Persons and in Patients. R. Nothhaas.—p. 778.
Action of Freund-Kaminer's Fatty Acids on Growth. V. Kilian and K. Pichler.—p. 781.
Use of Ottenstein's Diastase Test for Recognition of Internal Disorders. B. Schuler, W. Dreier and H. Jonas.—p. 782.
*Simplified Electrometric Determination of Halogen in Blood and Tissues. H. Paal and G. Motz.—p. 788.
Method for Determination of Phosphorus in Blood. G. Motz.—p. 789.

Electrometric Determination of Halogen in Blood.—Because their former use of the electrometric principle for the determination of small amounts of iodine in the blood was complicated, Paal and Motz have simplified their procedure: From 20 to 25 cc. of oxalated blood or several grams of tissue is placed in the closed system for incineration. After heating the quartz tube between the combustion flask and the ice-cooled absorption receiver (the first absorption receptacle contains 25 cc. of a 20 per cent solution of iodine-free sodium carbonate and the second 15 cc. of a 10 per cent solution of sodium carbonate) and after adjusting the water jet pump, the suction of which is throttled not only by the glass wool in the absorption receptacles but also by an interposed set screw, they suction from 100 to 115 cc. of concentrated sulfuric acid into the distillation flask through a capillary tube with funnel attachment. While the distillation flask is carefully heated with the bunsen burner, a 30 per cent solution of hydrogen peroxide is added in drops until complete decolorization has been obtained, which as a rule requires about 50 cc. Then, after about 10 cc. of a 10 per cent solution of sodium sulfite has been added, the distillation is continued for about twenty minutes, so that iodate, which might have been formed, is again reduced to iodide. The alkaline absorption fluids are washed in a Kjeldahl-flask. In order to destroy possibly existing oxidation stages of iodine, sodium sulfite (in an amount that can be placed on the point of a knife) is added and dissolved. Then, in order to precipitate the iodine in the fluid, a mixture of 50 cc. of two normal sulphuric acid and 1 cc. of tenth normal silver nitrate is added. The weakly acidified solution becomes at once turbid and halogen silver precipitates (all iodine as silver iodide, bromine as silver bromide and a little chlorine as silver chloride). Precipitation is promoted by adding a few drops of diluted nitric acid and by a short boiling. After several hours of standing, the precipitate is filtered through a porcelain dish that has been boiled with nitric acid and has been washed halogen free and then is thoroughly washed several times with several cubic centimeters of hot, iodine-free water. The dried silver precipitate is decomposed in the dish by the addition of a hot mixture of 1 cc. of a 10 per cent solution of sodium hydroxide with 1 drop of hydrazine and from 2 to 3 cc. of bidistilled water. In the course of the reduction, metallic silver is formed and held back on the filter, whereas the halogens pass into the filtrate. The filter residue is thoroughly washed with small portions of hot iodine-free water, so that the entire quantity of filtrate is at the most 12 cc. After the filtrate has been acidified with about 4 cc. of normal sulfuric acid, the electrometric test is made. The authors give a tabular report of the electrometric determination of the blood iodine and discuss the electrometric determination of chlorine and bromine.

Medizinische Klinik, Berlin

32: 721-756 (May 29) 1936

Shrinking Processes in Silicosis. V. Reichmann.—p. 726.
Experiences with Resection of Nerves Going Toward Kidney in Diseases of Kidney. W. Rieder.—p. 729.
Arrhythmia after Psychic and Somatic Traumas. G. W. Parade.—p. 733.
Noteworthy Case of Precipitated Labor. A. M. Marx.—p. 734.
Postdiphtheric Hemiplegia. A. Kral.—p. 735.
*Possibility of Influencing Hiccups by Short Wave Therapy. E. Weissenberg.—p. 737.

Short Wave Therapy in Hiccups.—Weissenberg points out that hiccups may develop in the course of encephalitic processes, influenza, abdominal disorders and after laparotomies. The author says that hiccups usually yield rapidly to treatment with short waves. He describes six cases in which the hiccups had persisted for from several hours to two weeks and in five of which the hiccups were counteracted by weak doses of short waves applied to the occiput, the epigastric region or the cervical sympathetic. He thinks that, although the mechanism of the treatment is not fully explained, the possibility of the removal of a symptom that greatly impairs the general condition justifies a trial with short wave therapy in cases of persistent hiccups.

Medizinische Welt, Berlin

10: 733-770 (May 23) 1936. Partial Index

*Nonspecific Vaginal Leukorrhea of Adults and Exudative Diathesis. H. Geiger.—p. 733.
Disturbances of Renal Function and Psychosis. C. Riebeling.—p. 736.
Present Status of Statistics of Cancer Problem. M. Hecht.—p. 738.
Present Status of Treatment of Whooping Cough. H. Vogt.—p. 740.
Danger in Delayed Administration of Diphtheria Serum. H. Kleinschmidt.—p. 743.
Plaut-Vincent's Angina. E. Reye.—p. 743.
Injection or Surgery in Treatment of Varicose Veins. P. Linser.—p. 745.

Leukorrhea and Exudative Diathesis.—In a discussion of gonorrhea, Geiger points out that the opinion prevails that endogenic factors are active before exogenic factors (invasion of pathogenic bacteria, trauma) exert their influence. He thinks that the rôle of trichomonas infection has been overestimated

and that constitutional factors play a part in nongonorrheal leukorrhea. He shows that constitutional anomalies such as infantilism, asthenia and the exudative diathesis are closely related to nonspecific leukorrhea. He points out that the term "exudative diathesis" designates a predisposition to an increased secretory action of the skin and of the mucous membranes during childhood and that a variety of disorders of the skin and of the mucous membranes, such as urticaria, impetigo, strophulus, chronic catarrhs of the respiratory tract and nongonorrheal vulvovaginitis, are frequent in such cases. Neuropathic conditions often appear as accompanying symptoms. The author observed that in many patients with frequent catarrhal disturbances of the respiratory apparatus the anamnesis revealed an exudative diathesis during childhood and that many of the women and girls received treatment also for nongonorrheal leukorrhea. At the women's clinic later, whenever the anamnesis of women with nongonorrheal leukorrhea disclosed exudative processes during childhood, the nasopharyngeal region was carefully inspected and nervous symptoms (urticaria, bronchial asthma, angioneurotic edema and vasomotor rhinitis) were found in nearly all these cases. In treatment he largely dispensed with the local therapy of leukorrhea and stressed a general treatment in the form of a predominantly vegetarian diet with restricted salt intake but with a high vitamin content. He also prescribed cod liver oil and calcium. Usually this treatment produced improvement after from ten to fourteen days. There was improvement in the leukorrhea and in the general condition, and the accompanying symptoms, such as rhinitis, disappeared. When the treatment was discontinued, relapses occurred.

10: 807-844 (June 6) 1936. Partial Index

Early Diagnosis of Pulmonary Tuberculosis in Daily Practice. F. Koester.—p. 815.
Erroneous Diagnoses in Pulmonary Tuberculosis. E. Engelhardt.—p. 819.
*Modified Ziehl-Neelsen Staining Method. K. H. Lange.—p. 822.
Benign Spontaneous Pneumothorax of Tuberculous Origin. P. Heilmann.—p. 824.

Modified Ziehl-Neelsen Staining Method. — Lange describes a modification of the Ziehl-Neelsen method: The air-dried, relatively thick smear is left for twenty-four hours in carbolfuchsin that has been diluted to half the concentration by means of 5 per cent phenol. After rinsing with water, it is rapidly decolorized with 3 per cent hydrochloric acid alcohol, and it is left in 96 per cent alcohol until decolorization has become complete. Then the preparation is placed for four or five minutes in aqueous solution of iodine and dried with blotting paper. Instead of treating the specimen with aqueous solution of iodine, it is permissible to pass over the decolorized and dried (with blotting paper) preparation some cotton that has been saturated with tincture of odine. The author maintains that this method of staining reveals a much larger number of tubercle bacilli than does the customary Ziehl-Neelsen method, and for this reason it is possible to dispense with the methods that are employed to bring about an abundant growth of tubercle bacilli. Moreover, this modification is less expensive and less complicated. It is especially suited for the demonstration of tubercle bacilli in the sputum but not for their detection in the feces.

Münchener medizinische Wochenschrift, Munich

83: 835-874 (May 22) 1936. Partial Index

Birth Injuries of Children. H. Naujoks.—p. 835.
*Experimentally Produced Reflex Epilepsy. W. Baumann.—p. 841.
Influenzal Pneumonias. O. Gsell.—p. 843.
Medicinal Induction of Labor by Treatment of Primary Weakness of Labor Pains with Quinine Calcium. H. Winkler and H. Vetter.—p. 847.
Gastric Cancer and Its Causes. M. Hindhede.—p. 852.

Experimentally Produced Reflex Epilepsy.—Baumann points out that formerly it was assumed that in entirely normal subjects epileptic attacks could be elicited by pressure on a sensory peripheral nerve and centripetal conduction to the brain. This standpoint is no longer tenable in that it is now believed that a convulsive tendency in the central nervous system is necessary. This convulsive tendency may be congenital (as in subjects with genuine epilepsy) or acquired by cerebral trauma, incretory disturbances or brain lesions. In this connection the question arises whether so-called reflex epilepsy may develop in patients with a convulsive tendency. The author thinks that in the present status of our knowledge the answer must be affirmative. The type of the eliciting agent is of no importance; at any rate it is erroneous to assume that only a pressure from a scar or from a tumor could elicit an attack of reflex epilepsy. Theoretically considered, every stimulus, whether mechanical, thermic, chemical or electrical, can do this. In discussing the conduction of the stimulus from the periphery to the central organ, the author points out that it is not likely that it takes place by way of the sensory nerves; he believes with Foerster that it occurs by way of the vascular sympathetic. This theory is corroborated by experiments, which the author carried out in collaboration with Muck, who, in the course of his epinephrine probe test, had found that after freezing of a radial artery with ethyl chloride the white streak sign appeared on the same side of the nose and in cases in which the phenomenon had not been present before. When the epinephrine probe test was once made on a patient with suppurating meningitis, the freezing was followed by an epileptic attack, although the patient had never before had such an attack; that is, the attack was elicited by way of the vascular sympathetic. Subsequently, Muck made his epinephrine probe test on a number of patients with genuine and with symptomatic epilepsy, many of whom were patients in the author's clinic. The author describes his observations on five patients, which show that by spraying with ethyl chloride true epileptic attacks can be elicited in persons with a convulsive tendency, the majority of whom belong to the group of patients with traumatic or symptomatic epilepsy. To be sure, reflex epilepsy by means of freezing with ethyl chloride can be elicited also in some cases of genuine epilepsy, but the author gained the impression that it is more readily elicitable in traumatic and symptomatic than in genuine epilepsy.

Zeitschrift für Kinderheilkunde, Berlin

58: 1-86 (May 20) 1936

*Pathologic Anatomic Investigations on Nature of Osteogenesis Imperfecta. K. L. Winkelmann.—p. 1.
*Serologic Investigations Following Vaccination with Whooping Cough Bacilli: Foundations of Active Immunization. W. Keller.—p. 23.
Connections Between Climate and Pneumonias. H. Meseth.—p. 41.
*Phosphatolysis in Human Erythrocytes. H. Suntheim.—p. 54.
Occurrence of Cerebral Hemorrhages in Hemorrhagic Purpura. E. Traub.—p. 67.
Etiology and Therapy of Anemia in Premature Infants. Rose Scholz.—p. 73.

Osteogenesis Imperfecta.—Winkelmann describes studies on the pathologic anatomy of osteogenesis imperfecta on the basis of which he reaches the conclusion that it is merely a retardation in the normal development of the fetal bones and that there is no change in the osteogenic processes. The osteogenesis is imperfect. In view of this nature of the disease he concludes that it is essential to help the child by careful nursing through the first most dangerous period of life and to protect it particularly against those hazards which may lead to an infection of the air passages and the lung. This demand is the more justified since the clinical and anatomic factors indicate that with this type of treatment the life of otherwise healthy children can be preserved.

Serologic Investigations Following Vaccination with Whooping Cough Bacilli. — Keller studied the theoretical foundations of active immunization against whooping cough. By means of the complement fixation test he examined the antigenic action of ten different whooping cough vaccines that had been prepared according to various methods. The investigations revealed that the efficacy of the vaccination, if judged on the basis of the antibody titer produced, depends largely on the manner of application, the total dose, and, particularly, on the mode of preparation of the vaccine. It was found that: (1) the bacillary vaccines are superior to the vaccines in which the bacilli have been dissolved; (2) the antigenic action of the various strains of the bacillus differs greatly in human subjects and the toxicity in the animal experiment is no measure for this; (3) monovalent vaccines from a potent antigenic strain are better and more reliable than polyvalent vaccines that are composed of strains of various potency; (4) the excess over

a certain total dose does not improve the results in persons who are constitutionally poor antibody formers. A small percentage of vaccinated persons, even in case of optimal vaccination, are more or less refractory to antigenic action. The author did not detect a relationship between the capacity to form antibodies and the type of blood group or the blood factors M and N. Even nurslings form a considerable number of antibodies in response to a suitable vaccination. The curve indicating the antibody content increases before the tenth day after the first vaccination; it usually reaches its maximum between the tenth and the fourteenth day and after that gradually subsides again so that usually at the end of twenty weeks (the duration varies greatly) the complement fixation reaction is again negative.

Phosphatolysis in Human Erythrocytes. — Suntheim investigated phosphatolysis in human erythrocytes, using heparinized blood in the tests. 1. He found that carbon dioxide produces the greatest acceleration of phosphate cleavage but that other acids may take its place, for citric acid, pyroracemic acid, hydrochloric acid, acetic acid and lactic acid appeared in the four hour value. 2. Sodium fluoride, sodium oxalate and the higher concentrations of citric acid inhibit phosphatolysis, and this inhibitory effect cannot be completely counteracted by carbon dioxide. 3. The alkali cations have no effect on phosphatolysis, whereas the alkaline earths have an inhibiting effect. However, this inhibition can be compensated by carbon dioxide. 4. It appears that the principle of the exchange of anions is of greater importance in the interpretation of phosphatolytic processes than is the p_H. 5. In the heparinized blood a lively glycolysis takes place without disappearance of phosphate. The organic phosphorus compounds are probably further decomposed by unimpaired erythrocytes with such rapidity that binding and composition remain in equilibrium. The more lactic acid develops, the greater the cleavage. 6. The theory of the inhibiting action of glycolysis on phosphatolysis does not apply to intact erythrocytes. The irradiation of heparinized blood with ultraviolet rays was without influence on the phosphate cleavage.

Sovetskiy Vrachebnyy Zhurnal, Leningrad

April 30, 1936 (No. 8) pp. 561-640. Partial Index

Local Anesthesia in Performing Artificial Abortion. P. I. Kolosho.—p. 569.
Diathermy Treatment of Breasts for Uterine Myoma, Metritis and Other Uterine Disturbances. G. I. Russin.—p. 583.
Congenital Hypertonic-Athetotic Disturbances and Icterus Gravis Neonatorum. M. I. Togikhes and S. Ya. Khotina.—p. 592.
Fresh Yeast Therapy of Cachexia. N. Ya. Chervyakovskiy.—p. 596.
Symptoms of Chronic Amebiasis. I. A. Alekseev-Berkman.—p. 601.
*Lead in Duodenal Juice in Saturnism. N. K. Alyavdin and E. A. Peregud.—p. 604.

Lead in Duodenal Contents in Lead Poisoning.—Alyavdin and Peregud investigated the lead content of the duodenal juice in twenty-eight cases of existing or suspected lead poisoning and in five normal controls. The method consisted of reducing the organic matter to ash, precipitating the lead from the ash with hydrogen sulfide, treating it with potassium bichromate and determining the resulting lead chromate iodometrically. They found that lead was present in the duodenal contents in cases of lead poisoning with about the same frequency as in the urine. It may be present in the urine alone or in the duodenal contents alone. Its concentration in the duodenal contents was considerably greater than in the urine. In about one third of the cases lead was found in the duodenal contents, when it was absent in the urine, in amounts sufficient not to leave any doubt as to its pathologic significance in the presence of other symptoms. They conclude that the finding of lead in the duodenal contents may, in the absence of other symptoms of lead intoxication, lead to a correct diagnosis. The test is only of a relative value, since it may be negative in the presence of unmistakable signs of lead intoxication. The authors believe that the method opens up new perspectives in the study of lead poisoning. It may, on further investigation, throw light on the circulation of lead in the organism and on the mechanism of its excretion by the duodenum. They likewise suggest that the removal of some of the lead by the duodenal tube may be of value in the treatment.

Nederlandsch Tijdschrift voor Geneeskunde, Haarlem

80: 3241-3304 (July 11) 1936

Cushing's Syndrome. M. Hommes.—p. 3257.
*Thyroid Disturbances and Arthritis. H. J. Viersma.—p. 3264.
Danger of Duck Paratyphoid for Man. A. Charlotte Ruys.—p. 3272.

Thyroid Disturbances and Arthritis.—Viersma states that the conditions which have called attention to a possible connection between the thyroid and arthritis are (1) the frequent occurrence of arthritis in youth in goiter countries, (2) the frequent observation of low basal metabolism in chronic arthritis and (3) the favorable influence of thyroid extract on some cases of chronic arthritis. Although it has seemed reasonable enough to connect arthritis with hypothyroidism, until lately it was not known that there are also cases in which hyperthyroidism is the undoubted cause of arthritis. The author describes the history of a man, aged 52, who suffered from exophthalmic goiter and developed in the course of six or seven weeks total fixation of both shoulder joints with severe pains radiating to the arms and atrophy of the shoulder and upper arm muscles which rendered him completely helpless. Suspicion was directed toward hyperthyroidism and attention called to Duncan's report of 292 cases of hyperthyroidism with articular disturbances, in eighty-five of which an etiologic connection was accepted between the two disorders. While any other of the usual treatments failed in these cases, subtotal removal of the thyroid brought improvement, frequently within forty-eight or seventy-two hours after the intervention. In the present case, after a preliminary twelve day treatment with di-iodotyrosin (3.5 di-iodo-4-oxyphenylalanine), subtotal thyroidectomy caused disappearance of the pains in thirty-six hours. Follow-up examination three months later showed a 45 degree abduction in the shoulders and a 30 degree anteroposterior movement with a slight degree of rotation to the left but none to the right. Atrophy of the deltoid and of the supraspinatus was still marked, but the patient was ready to resume his occupation.

Finska Läkaresällskapets Handlingar, Helsingfors

79: 391-484 (May) 1936

Applicability of Original or Modified Binet-Simon Method of Intelligence Test in Finland. T. Brander.—p. 395.
Who Is Mentally Defective? Figures and Citations Illuminating This Important Question. T. Brander.—p. 409.
Disturbances in Metabolism of Plasma Protein and Attempts at Bone Marrow Therapy. M. C. Ehrström.—p. 421.
*Benign Meningitis. H. Björk.—p. 428.

Benign Meningitis.—Björk reports twelve cases of nonsyphilitic meningitis treated since 1933. In one case the meningitis set in with grave symptoms on the fourth day of an acute polyarthritis and receded in a few days. Six cases occurred simultaneously with or a couple of days after the onset of parotitis. The general condition was relatively little affected, although there were marked changes in the spinal fluid in three of the cases. The cell count varied from 65 to 950; the pleocytosis was mononuclear. Seven cases were complications connected with an influenza-like disorder, appearing with chills and high temperature, in most of the cases after apparent recovery from the basic disorder. During the latent period the patients had felt tired and apathetic. In two instances the clinical picture was atypical, with almost exclusively psychic symptoms in the one, suggestive of a schizophrenia, and only a paralysis of the bladder at the start in the other. In two cases there was a transitory disturbance of the extremities. In one case there was a roseola-like exanthem and in another diarrhea, symptoms reported in epidemic serous meningitis in other countries. All the patients recovered, but in three the course was protracted; in one, lumbar puncture was done eleven times, in another, twenty-five times, and in one a transient cachexia developed.

Hygiea, Stockholm

98: 353-384 (June 15) 1936

Prognosis and Treatment of Exudative Pleuritis. S. Karlson.—p. 360.
*Cancer in Tuberculosis and Tuberculosis in Cancer. B. Strandberg.—p. 372.

Cancer in Tuberculosis and Tuberculosis in Cancer.—Strandberg's material of 1,206 cases of cancer and 1,836 of tuberculosis out of 5,366 necropsies from 1929 to 1935 showed that cancer and active tuberculosis occurred simultaneously less often than they would occur if the disorders were wholly independent of each other. This holds particularly in the cases in which tuberculosis has been more active or more dominating.